# GTFS Pathways Extension

## Acknowledgement of Country

Transport for NSW acknowledges the traditional custodians of the land on which we work and live.

We pay our respects to Elders past and present and celebrate the diversity of Aboriginal people and their ongoing cultures and connections to the lands and waters of NSW.

Many of the transport routes we use today – from rail lines, to roads, to water crossings – follow the traditional Songlines, trade routes and ceremonial paths in Country that our nation's First Peoples followed for tens of thousands of years.

Transport for NSW is committed to honouring Aboriginal peoples' cultural and spiritual connections to the lands, waters and seas and their rich contribution to society.

# Transport
for NSW

# Table of Contents

# Document control

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# Versions

| Version | Amendment notes |
|---|---|
| 1.0 | Original version released in May 2023 |

# Related Documentation

| Document | Location |
|---|---|
| GTFS specification | https://gtfs.org/schedule/ |
| TfNSW Complete GTFS release notes | https://opendata.transport.nsw.gov.au/dataset/timetables-complete-gtfs |

# Definitions

| Term | Definition |
|---|---|
| GTFS | The General Transit Feed Specification (GTFS) defines a common format for public transportation schedules and associated geographic information |
| GTFS-R | GTFS-Realtime is a feed specification that allows public transportation agencies to provide real-time updates about their fleet to application developers.<br>It is an extension to GTFS |

# 1.  Introduction

## 1.1.  Purpose

The purpose of this document is to describe the structure and contents of the pathways.txt and levels.txt files supplied in the 'Timetables Complete GTFS' dataset by Transport for NSW (TfNSW) for consumption and use by TfNSW systems and business units, application developers and other TfNSW Open Data subscribers.

This document will only cover the pathways.txt and levels.txt files. This document will not duplicate existing documentation regarding the standard GTFS Schedule (GTFS-S) features; please refer to the GTFS specification and the TfNSW Timetable Complete GTFS Release Notes from Open Data in the related documentation section for any GTFS-S information.

The intended audience of this document is consumers who provide customer information to support accurate transfers at transport interchanges (stations, stops, wharves etc.), for situational awareness and planning management products.

## 1.2.  Background

TfNSW has been supplying a GTFS dataset for journey planning for many years. This dataset has primarily focused on the vehicle trips. To further enhance this dataset, the optional files pathways.txt and levels.txt will be included. These files enable the addition of pedestrian navigation within transport interchanges.

The GTFS-Pathways extension uses a graph representation to describe transport interchanges, with nodes (the locations) and edges (the pathways).

To go from the entrance to a "platform", the customer will traverse walkways, fare gates, stairs, lifts etc. (which are edges represented as pathways). The pathways concept also includes a generic location, to represent, for example, a walkway crossing from which different walkways can be taken.

# 2. General Technical Notes

## 2.1. File Structure

The 'Timetables Complete GTFS' file set is a 'ZIP' format compressed archive – a .zip file - containing 11 text files. Each text file within the .zip file is a comma delimited / comma separated format file with the ".txt" extension. For example:

| Name | Type | |
| --- | --- | --- |
| agency.txt | Text Document | |
| calendar.txt | Text Document | |
| calendar_dates.txt | Text Document | |
| levels.txt | Text Document | |
| notes.txt | Text Document | |
| pathways.txt | Text Document | |
| routes.txt | Text Document | |
| shapes.txt | Text Document | |
| stop_times.txt | Text Document | |
| stops.txt | Text Document | |
| trips.txt | Text Document | |

## 2.2. Generation Triggers

The 'Timetables Complete GTFS' dataset is generated daily . Note, new transport interchanges will be included in the pathways file as they are modelled or change when there has been development at specific transport interchanges.

## 2.3. Scope of a Station/Stop/Transport Hub

For the purpose of GTFS-Pathways, transport interchanges are modelled from a multi-modal perspective. As such a train station may include pathways to bus stops, ferry wharves, light rail stops as well as other MaaS elements such as car parks, bike sheds or bike lockers etc.

# 3.  GTFS Pathways Extension

## 3.1.  Overview

The following diagram provides a physical data model view of the relationship between the current files in the 'Timetables Complete GTFS' dataset and the new pathways files. The additional files are:

- pathways.txt

- levels.txt
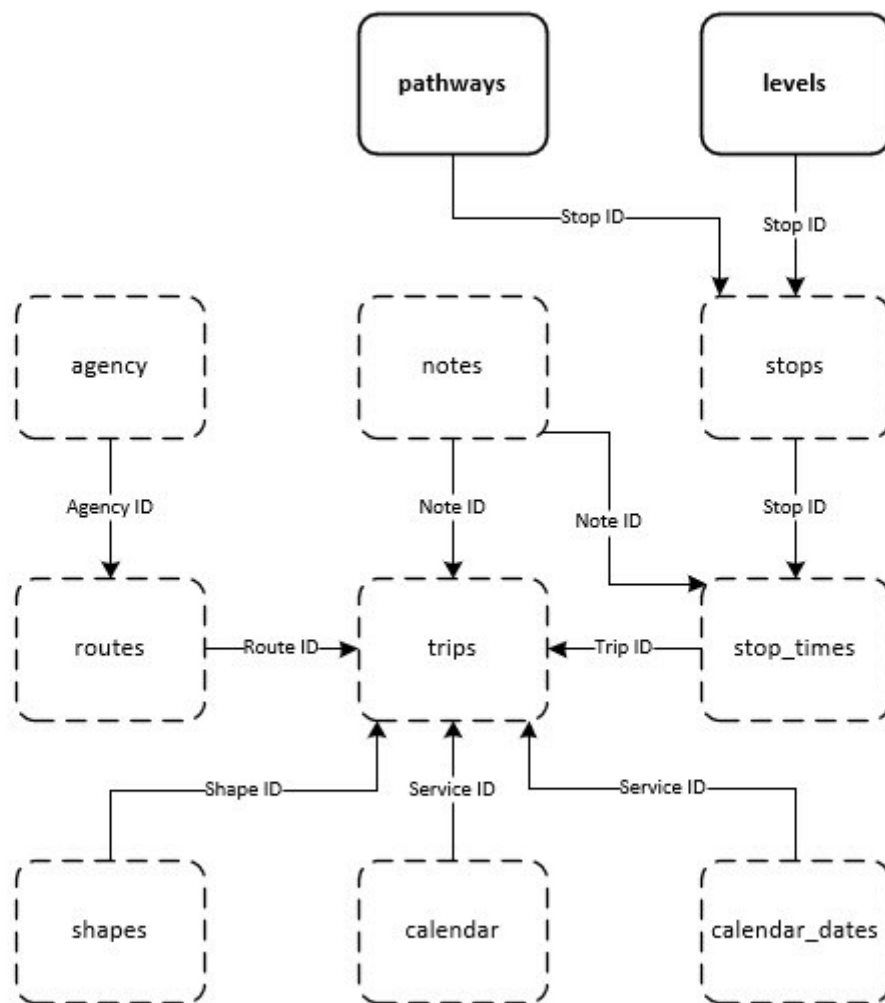


The content of the new files is discussed below

## 3.2. Pathways

This file provides information for the customer about how to book the service

| Field name | Type | Required | Description |
|---|---|---|---|
| pathway_id | ID | Required | An ID that uniquely identifies the pathway |
| from_stop_id | ID referencing stops.stop_id | Required | Location at which the pathway begins. It contains a stop_id that identifies a platform, entrance/exit, generic node or boarding area from the stops.txt file |
| to_stop_id | ID referencing stops.stop_id | Required | Location at which the pathway ends. It contains a stop_id that identifies a platform, entrance/exit, generic node or boarding area from the stops.txt file |
| pathway_mode | Enum | Required | Type of pathway between the specified (from_stop_id, to_stop_id) pair. Valid values for this field are:<br>• 1: walkway<br>• 2: stairs<br>• 3: moving sidewalk/travelator<br>• 4: escalator<br>• 5: elevator<br>• 6: fare gate (or payment gate): A pathway that crosses into an area of the station where a proof of payment is required (usually via a physical payment gate).<br>• 7: exit gate: Indicates a pathway exiting an area where proof-of-payment is required into an area where proof-of-payment is no longer required. |
| is_bidirectional | Enum | Required | Indicates in which direction the pathway can be used:<br>• 0: Unidirectional pathway, it can only be used from from_stop_id to to_stop_id<br>• 1: Bidirectional pathway, it can be used in the two directions<br><br>Fare gates (pathway_mode=6) and exit gates (pathway_mode=7) cannot be bidirectional |
| traversal_time | Positive Integer | Optional | Last time on the last day before travel to make the booking request.<br><br>Example: "Ride must be booked 1 day in advance before 5PM" will be encoded as prior_notice_last_time=17:00:00.<br><br>Conditionally Required:<br>- Required if prior_notice_last_day is defined.<br>- Forbidden otherwise. |

## 3.3.  Levels

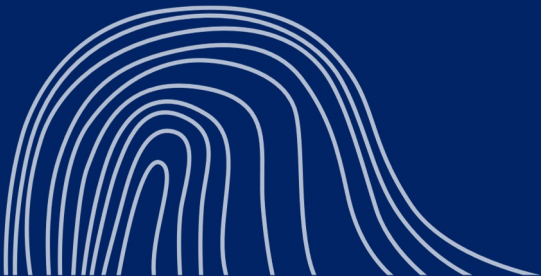This file provides information about the locations where pick up or drop off is possible

| Field name | Type | Required | Description |
|---|---|---|---|
| level_id | ID | Required | Id of the level that can be referenced from stops.txt. |
| level_index | Float | Required | Collection of "Feature" objects describing the locations. |
| level_name | Text | Optional | Optional name of the level (that matches level lettering/numbering used inside the building or the station). Is useful for elevator routing (e.g., "take the elevator to level "Mezzanine" or "Platforms" or "-1"). |

# 4.   GTFS-R

Real time (GTFS-R) updates are not provided by TfNSW for pathways.

In the future, TfNSW will provide real time status of facilities/ pathway_mode to support update of real time adjustments to walking paths and trip options for customers. TfNSW is yet to define the data format for this real time status.