

SIF NZ DATA MODEL - SCHEDULE OVERVIEW – v1.4

The schedule data objects in the SIF NZ Data Model have been designed to be as flexible as possible to allow for the myriad of different scheduling and timetabling structures used within the New Zealand Education System.

1 Schedule Background

A schedule is set up by a provider to manage their timetable for their students, teachers, curriculum and resources for part or all of a calendar year.

1.1 Schedule Structure

A schedule is made up of a rotation of one or more Academic Days, each of which represents a regular structured day undertaken by the provider. The Academic Days in the Schedule rotation don't have to have the same structure across the whole schedule. For example, at Hogwarts High, Academic Days A through D are made up of five Periods. But on Fridays (Academic Day E) there are only four periods, with the last period being two hours long instead of the usual one.

As the five days of the rotation (Days A through E) only have one of two structures, Hogwarts can then assign one of two Bell Schedules to each of the academic days. The Bell Schedule defines when each Period of the Academic Day starts and ends, e.g. Period 1 is 9am – 9:50am, Period 2 is 10am – 10:50am etc.

This Schedule structure is held in the Schedule, AcademicDay, SchedulePeriod and BellSchedule data objects. Below is an example of a schedule for Hogwarts High, with the 5 defines Academic Days, their Periods and associated Bell Schedules.

Hogwarts High

Secondary Term 2 Schedule – 1 July to 30 September

Academic Days A - D	Bell Schedule 1		Academic Day E	Bell Schedule 2	
Period	Start Time	End Time	Period	Start Time	End Time
Period 1	9am	9:50am	Period 1	9am	9:50am
Period 2	10am	10:50am	Period 2	10am	10:50am
Period 3	11am	11:50am	Period 3	11am	11:50am
Period 4	1pm	1:50pm	Period 4	1pm	3pm
Period 5	2pm	3pm			

A school may have different schedule structures for different year groups, e.g. where a school is a composite school, primary school level students have a different bell schedules to secondary school students. Hogwarts High as the example above for secondary school students but it also has the structure below for primary school students.

Hogwarts High

Primary Term 2 Schedule – 1 July to 30 September

Academic Day F	Bell Schedule 3	
Period	Start Time	End Time
Morning Half Day	9am	11:50am
Afternoon Half Day	1pm	3pm

1.2 Schedule Dates

Once the structure of the schedule is defined it is then associated to specific calendar dates as applicable. For example Academic Days A through D take place Mondays to Thursdays, and Academic Day E takes place on Fridays. So if 1st July is a Monday then Academic Day A and its associated Bell Schedule and Periods will take place on 1st July, Day B on 2nd July, Day C on 3rd July and Day D on 4th July; finally Academic Day E and its associated Bell Schedule and Periods will take place on 5th July.

The mapping of Academic Days and Schedule Periods to specific calendar days is held in the ScheduleDate data object. Below is an example of mapping of Hogwarts's Secondary and Primary Term 2 schedules mapped to a set of specific calendar dates.

Hogwarts High

Secondary Term 2 Schedule – 1 July to 30 September

Calendar Date	Academic Day	Bell Schedule
Mon 1 July	Day A	Bell Schedule 1
Tue 2 July	Day B	Bell Schedule 1
Wed 3 July	Day C	Bell Schedule 1
Thu 4 July	Day D	Bell Schedule 1
Fri 5 July	Day E	Bell Schedule 2
Mon 8 July	Day A	Bell Schedule 1
Tue 9 July	Day B	Bell Schedule 1
Wed 10 July	Day C	Bell Schedule 1
Thu 11 July	Day D	Bell Schedule 1
Fri 12 July	Day E	Bell Schedule 2
...
Fri 30 September	Day E	Bell Schedule 2

Academic Days A - D		Bell Schedule 1	
Period	Start Time	End Time	
Period 1	9am	9:50am	
Period 2	10am	10:50am	
Period 3	11am	11:50am	
Period 4	1pm	1:50pm	
Period 5	2pm	3pm	

Academic Day E		Bell Schedule 2	
Period	Start Time	End Time	
Period 1	9am	9:50am	
Period 2	10am	10:50am	
Period 3	11am	11:50am	
Period 4	1pm	3pm	

Hogwarts High

Primary Term 2 Schedule – 1 July to 30 September

Calendar Date	Academic Day	Bell Schedule
Mon 1 July	Day F	Bell Schedule 3
Tue 2 July	Day F	Bell Schedule 3
Wed 3 July	Day F	Bell Schedule 3
Thu 4 July	Day F	Bell Schedule 3
Fri 5 July	Day F	Bell Schedule 3
...
Fri 30 September	Day F	Bell Schedule 3

Academic Days F		Bell Schedule 3	
Period	Start Time	End Time	
Morning Half Day	9am	11:50am	
Afternoon Half Day	1pm	3pm	

1.3 Teaching Group Timetable

Once the schedule structure has been defined the timetables for a provider’s teaching groups can be created. This timetable specifies the academic days that a teaching group is being taught on, the periods it is being taught in, the curriculum being taught, who is teaching, and the assigned room.

Each teaching group’s timetable is held in the TeachingGroupEvent data object. Below is an example of the timetable for Hogwart’s Purple teaching group, which follows the Secondary level schedule, and Yellow teaching group which follows the Primary level schedule.

Hogwarts High – Teaching Group Purple					
Secondary Term 2 Schedule – 1 July to 30 September					
	Day A	Day B	Day C	Day D	Day E
Period 1	Room 1 - Mr Smith Mathematics	Room 9 - Mrs Exam Social Science	Room 3 - Mr Test Science	Room 14 - Ms Doe English	Room 4 - Ms Doe Health Studies
Period 2	Room 14 - Ms Doe English	Room 1 - Mr Smith Mathematics	Gym - Miss Bloggs Physical Education	Room 3 - Mr Test Science	Room 9 - Mrs Exam Social Science
Period 3	Room 3 - Mr Test Science	Room 14 - MsDoe English	Room 1 - Mr Smith Mathematics	Room 9 - Mrs Exam Social Science	Room 5 - Mr Cook Food Technology
Lunch					
Period 4	Gym - Miss Bloggs Physical Education	Room 3 - Mr Test Science	Room 14 - Ms Doe English	Room 1 - Mr Smith Mathematics	Gym - Miss Bloggs Physical Education
Period 5	Room 11 - Ms Steel Hard Materials	Room 12 - Mr Clay Art and Design	Room 10 - Mrs Reo Te Reo	Room 2 - Mr Binary Computer Studies	

Hogwarts High – Teaching Group Yellow					
Primary Term 2 Schedule – 1 July to 30 September					
	Day F				
Morning Half Day	Room 1 - Mr Smith Mathematics English Science	Room 1 – Mr Smith Technology Arts Physical Education	Room 1 - Mr Smith Mathematics English Science	Room 1 – Mr Smith Technology Arts Physical Education	Room 1 - Mr Smith Mathematics English Science
Lunch					
Afternoon Half Day	Room 1 – Mr Smith Technology Arts Physical Education	Room 1 - Mr Smith Mathematics English Science	Room 1 – Mr Smith Technology Arts Physical Education	Room 1 - Mr Smith Mathematics English Science	Room 1 – Mr Smith Technology Arts Physical Education

Combining the teaching group's timetable from TeachingGroupEvent data object with the schedule date assignment data from ScheduleDate data object gives a completed date specific timetable for Hogwarts Purple teaching group:

Hogwarts High – Teaching Group Purple

Secondary Term 2 Schedule – 1 July to 30 September

	Mon 1 st July	Tue 2 nd July	Wed 3 rd July	Thu 4 th July	Fri 5 th July
9am - 9:50am	Room 1 - Mr Smith Mathematics	Room 9 - Mrs Exam Social Science	Room 3 - Mr Test Science	Room 14 - Ms Doe English	Room 4 - Ms Doe Health Studies
10am - 10:50am	Room 14 - Ms Doe English	Room 1 - Mr Smith Mathematics	Gym - Miss Bloggs Physical Education	Room 3 - Mr Test Science	Room 9 - Mrs Exam Social Science
11am - 11:50am	Room 3 - Mr Test Science	Room 14 - MsDoe English	Room 1 - Mr Smith Mathematics	Room 9 - Mrs Exam Social Science	Room 5 - Mr Cook Food Technology
Lunch					
1pm - 1:50pm	Gym - Miss Bloggs Physical Education	Room 3 - Mr Test Science	Room 14 - Ms Doe English	Room 1 - Mr Smith Mathematics	Gym - Miss Bloggs Physical Education
2pm - 3pm	Room 11 - Ms Steel Hard Materials	Room 12 - Mr Clay Art and Design	Room 10 - Mrs Reo Te Reo	Room 2 - Mr Binary Computer Studies	

It works just as well for simple timetables, with straightforward morning and afternoon periods as per the Yellow teaching group example below.

Hogwarts High – Teaching Group Yellow

Primary Term 2 Schedule – 1 July to 30 September

	Mon 1 st July	Tue 2 nd July	Wed 3 rd July	Thu 4 th July	Fri 5 th July
9am – 11:50am	Room 1 - Mr Smith Mathematics English Science	Room 1 – Mr Smith Technology Arts Physical Education	Room 1 - Mr Smith Mathematics English Science	Room 1 – Mr Smith Technology Arts Physical Education	Room 1 - Mr Smith Mathematics English Science
Lunch					
1pm - 3pm	Room 1 – Mr Smith Technology Arts Physical Education	Room 1 - Mr Smith Mathematics English Science	Room 1 – Mr Smith Technology Arts Physical Education	Room 1 - Mr Smith Mathematics English Science	Room 1 – Mr Smith Technology Arts Physical Education

1.4 Schedule Variations

Every so often one off events will occur that may impact the regular schedule. These one off events could impact a single date, or multiple dates, or one or more periods on a specific date(s).

Events that impact the schedule are held in the ScheduleEvent data object. There is a set of predefined standardised effects an event may have. (Note: Providers also have the ability to create custom effects if one of the standardised options does not provide the required change to the schedule. See Below)

List of Standardised Effects

Standard Effect	Effect Description
No Effect	This event has no effect on the school schedule, but it is recorded for display purposes.
Pause Schedule Rotation	Temporarily suspend the academic day rotation until a subsequent Resume Schedule event occurs.
Resume Schedule Rotation	Resume an academic day rotation previously suspended (paused).
Renumber Schedule Rotation	This event causes the day rotation on the school calendar to be renumbered, starting with any academic days specified as impacted by the event. If any terms are included in the event, those terms are activated effective on the start date of this event.
Insert Day into Rotation	This event causes an insertion in the normal academic day rotation of the schedule. That is to say, any academic days and bell schedules specified in the event are scheduled for the duration of this event, or school is cancelled if there are no academic days specified; after the event ends the academic day rotation resumes from the point at which it was interrupted, e.g. if it was Day 1 before the event, then it will be Day 2 afterwards.
Displace Day in Rotation	This event causes a displacement in the normal academic day rotation of the schedule. That is to say, any academic days or bell schedules specified in the event are scheduled for the duration of this event, or school is cancelled if there are no academic days values specified; after the event ends the rotation resumes from the point it would be at had the event not occurred, e.g. if it was Day 1 before the event, and the event duration was 1 day, then it will be Day 3 afterwards; Day 2 is overwritten by the event.
Start Term	Start one or more terms specified on this date without changing the academic day rotation.
End Term	This event terminates the academic schedule for any term(s) specified in the event. A term is required to be specified when using this schedule effect. Note that events take effect at midnight on the start date, so the designated term(s) do not occur on the actual day of the End Schedule event (i.e. the day prior to the event's start date is the last day the term(s) are in session).

Standard Effect	Effect Description
Customised Schedule Effect	This event creates a custom effect; with an arbitrary, customised set of periods and matching bell schedule replacing the normal rotation days of the schedule for the duration of the event.
Cancel Schedule Day	Cancel one or more specified Academic Days that would normally occur on this date. This is generally used to partially cancel the school schedule at the event start time on the event date. To fully cancel school on event date, use either the "insert" or "displace" schedule effect.
Additional Day	Set one or more additional academic days to apply to this calendar date in addition to those defined in the schedule. This can also be used to schedule school on a day on which it would not normally occur, such as a weekend. As a convenience, a list of academic days to remove from the calendar while this event is in effect can also be supplied.

1.5 Terms and Holidays

Other additional information about the schedule can also be captured such as the length of the terms a provider follows, or what holidays are recognised in the area that the provider lives and whether or not they impact the schedule, e.g. public holidays, regional holidays.

These are stored in ScheduleTerm and ScheduleHoliday respectively.

2 Conceptual Data Model

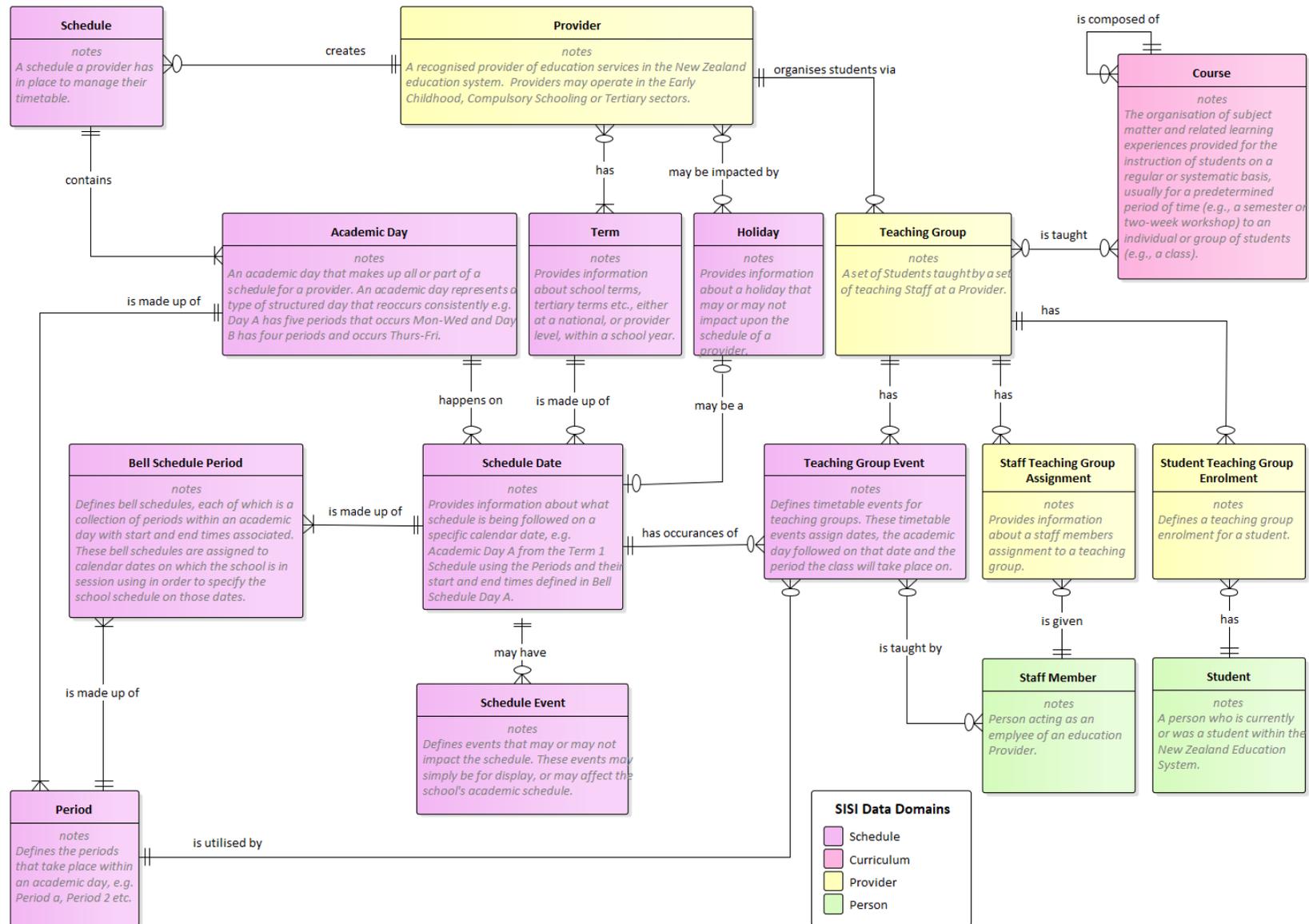


Figure 1: Schedule - Conceptual Model

3 Logical Data Model

The schedule concepts introduced in the conceptual model above is realised in the following Schedule, ScheduleHoliday, ScheduleTerm, ScheduleAcademicDay, SchedulePeriod, BellSchedule, ScheduleDate, ScheduleEvent and TeachingGroupEvent data objects.

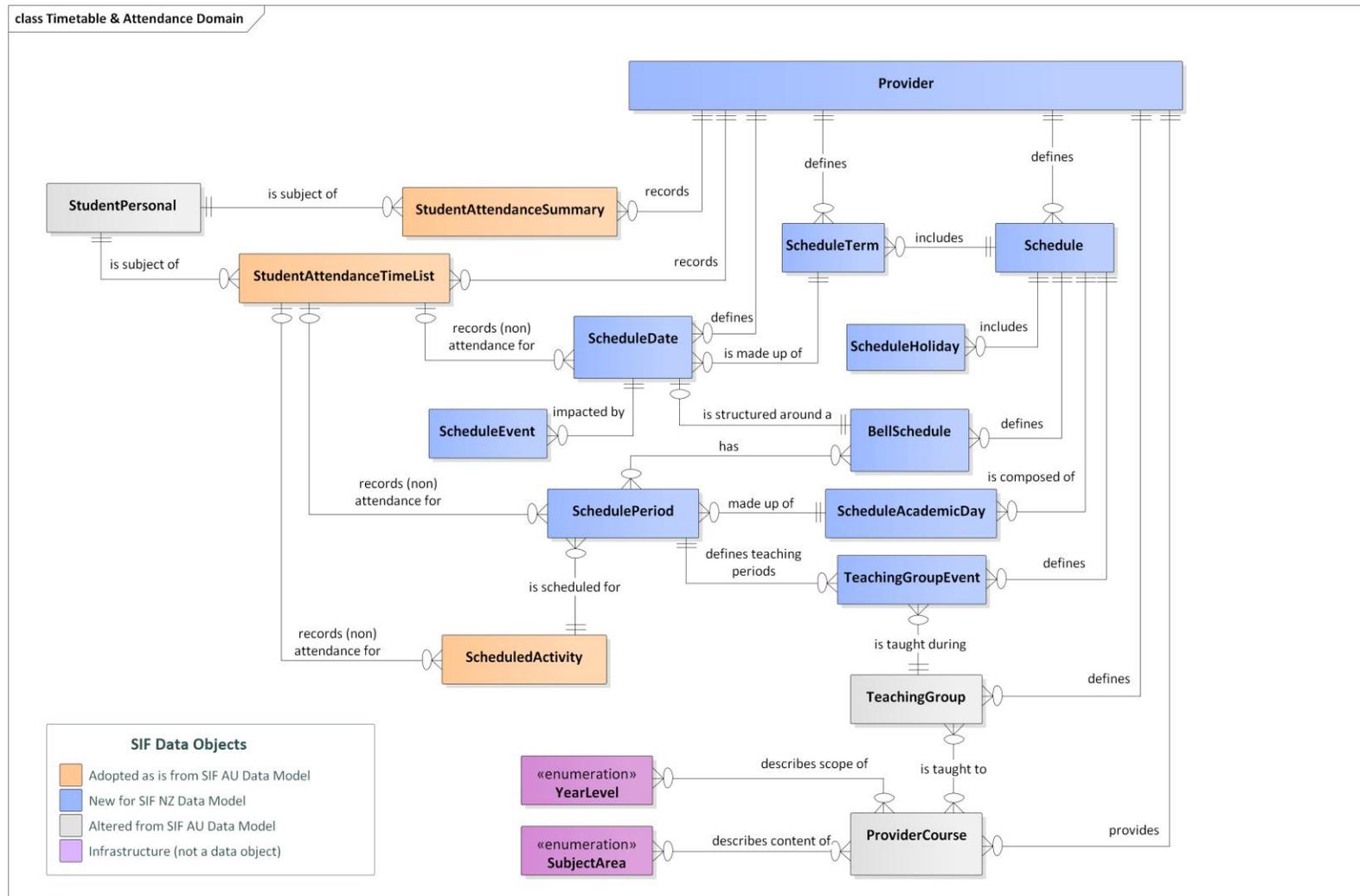


Figure 2: Timetable and Attendance Domain - Logical Model

4 Schedule Data Object

Information on a schedule set up by a provider to manage the timetable for their students, teachers, curriculum and resources for part of or all of a calendar year. A schedule is made up of Academic Days which represent a type of structured day undertaken by the provider, e.g. Academic Days A through D are made up of five Periods, which follows a regular Bell Schedule, and Academic Day E is made up of four periods which follows another Bell Schedule. This information is recorded using the Schedule data object (with matching API endpoints).

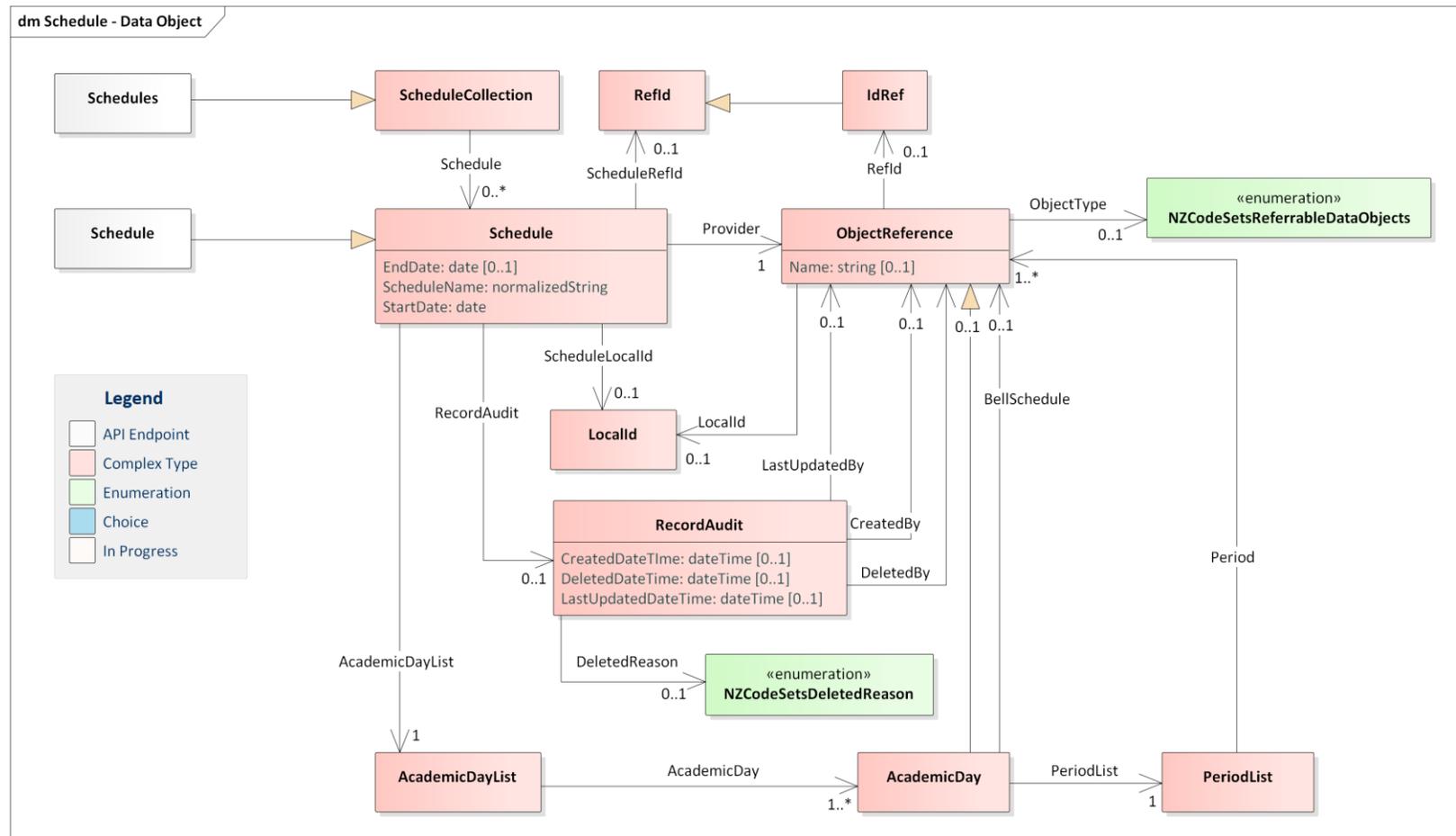


Figure 3: Schedule Data Object

5 ScheduleAcademicDay Data Object

Information on a Schedule's Academic Days which represent a type of structured day undertaken by the provider, e.g. Academic Days A through D are made up of five Periods, which follows a regular Bell Schedule, and Academic Day E is made up of four periods which follows another Bell Schedule. This information is recorded using the ScheduleAcademicDay data object (with matching API endpoints).

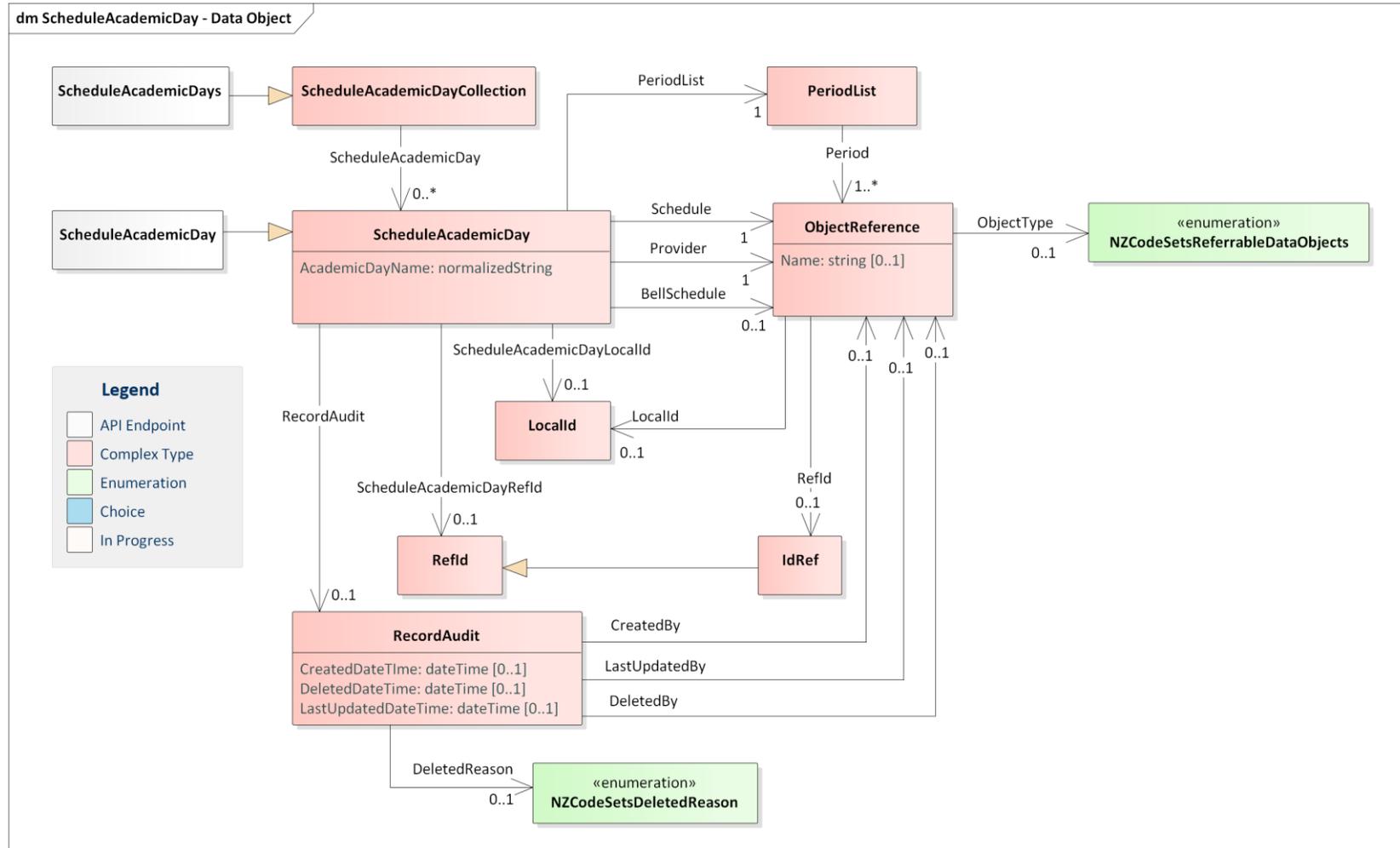


Figure 4: ScheduleAcademicDay Data Object

6 SchedulePeriod Data Object

Information on a period that takes place within an Academic Day, e.g. Period 1, Period 2 etc. Some providers may only have one Period defined for the whole day, whilst others may have many. This information is recorded using the SchedulePeriod data object (with matching API endpoints).

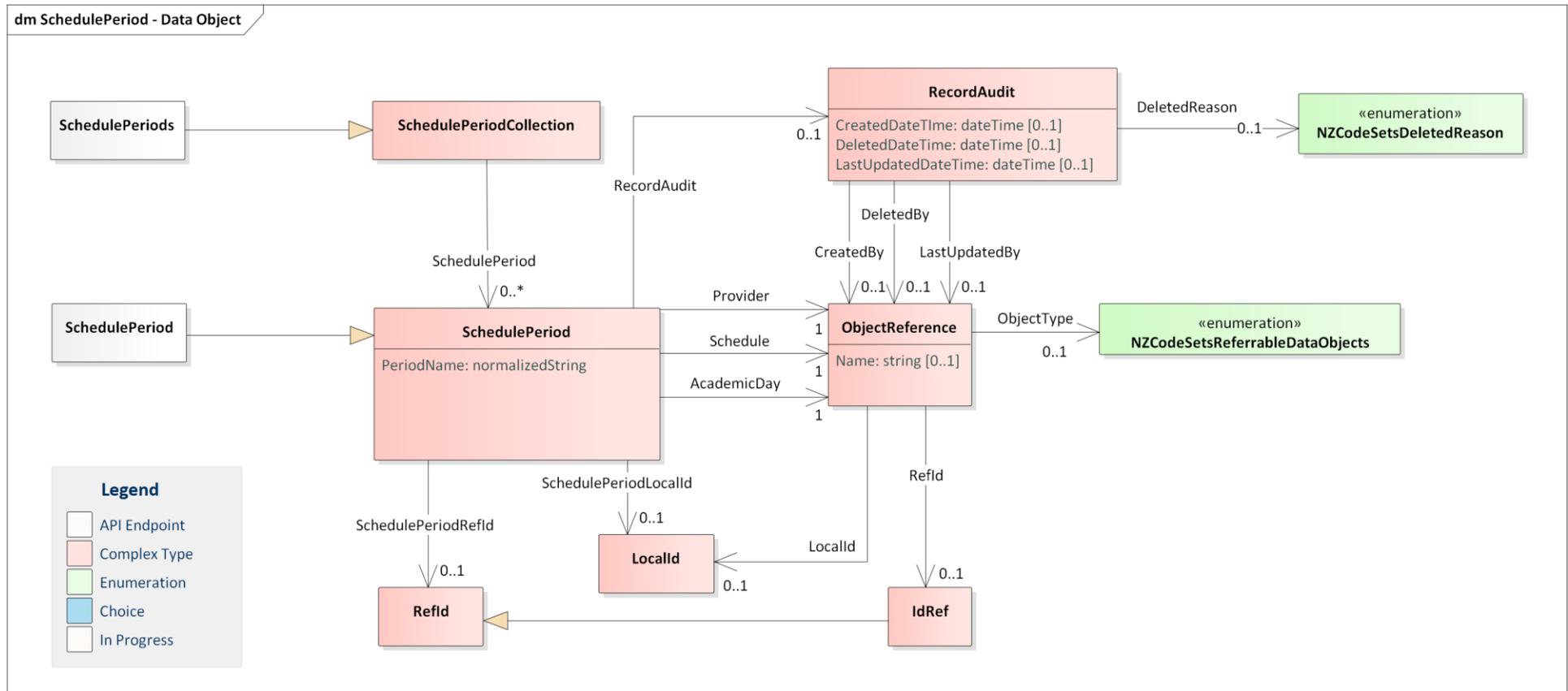


Figure 5: SchedulePeriod Data Object

7 BellSchedule Data Object

Bell Schedules are a collection of periods within an academic day with start and end times associated. These bell schedules are assigned to calendar dates on which the school is in session using ScheduleDate in order to specify the school schedule on those dates. These bell schedules should generally only be used to define standard day types. Exception days (unless they repeat multiple times and follow a common template) are defined using ScheduleEvent and ScheduleCustomDayEvent. This information is recorded using the BellSchedule data object (with matching API endpoints).

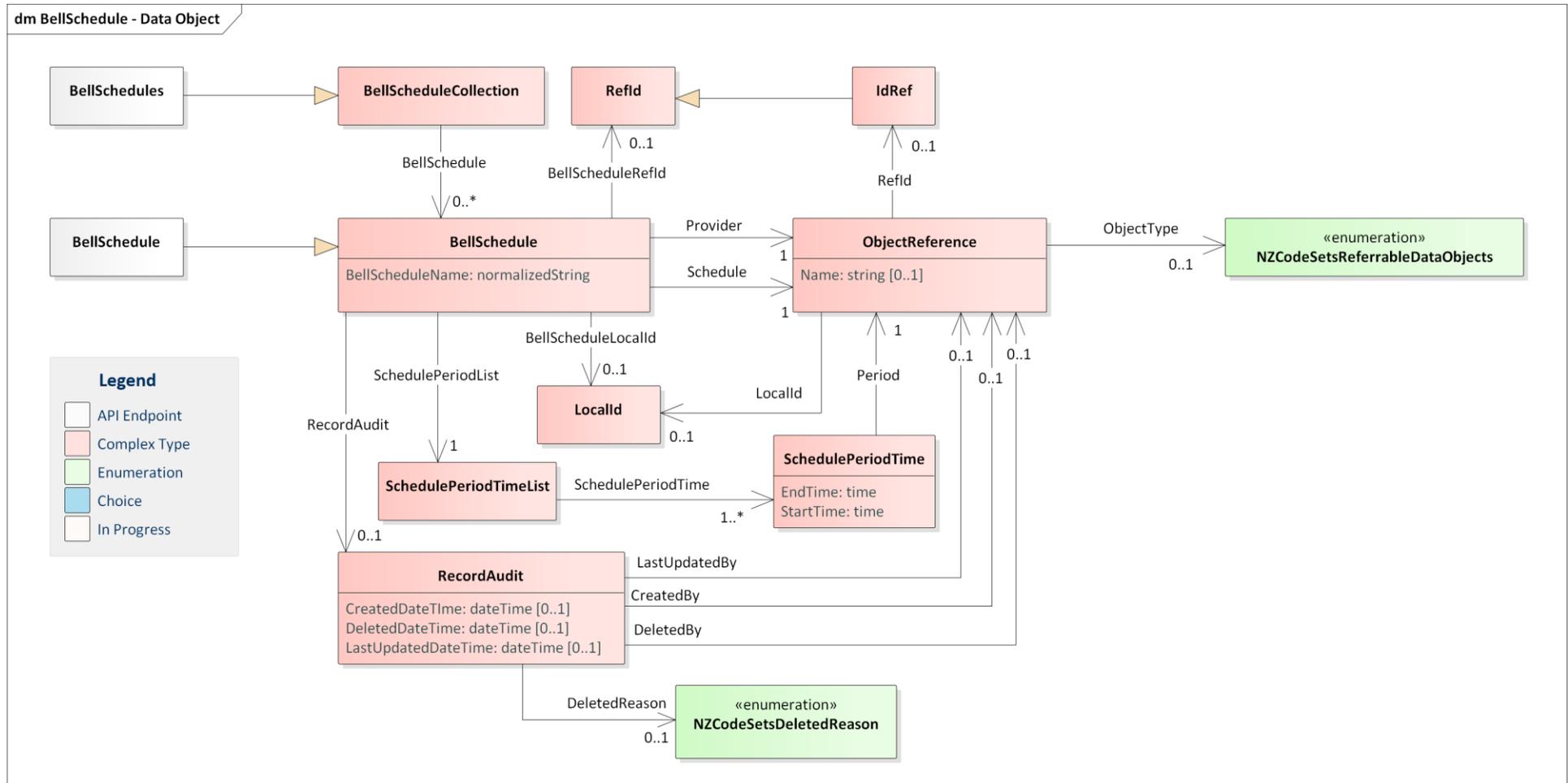


Figure 6: BellSchedule Data Object

8 ScheduleDate Object

Provides information about what schedule is being followed on a specific calendar date, e.g. Academic Day A from the Term 1 Schedule using the Periods and their start and end times defined in Bell Schedule Day A. This information is recorded using the ScheduleDate data object (with matching API endpoints).

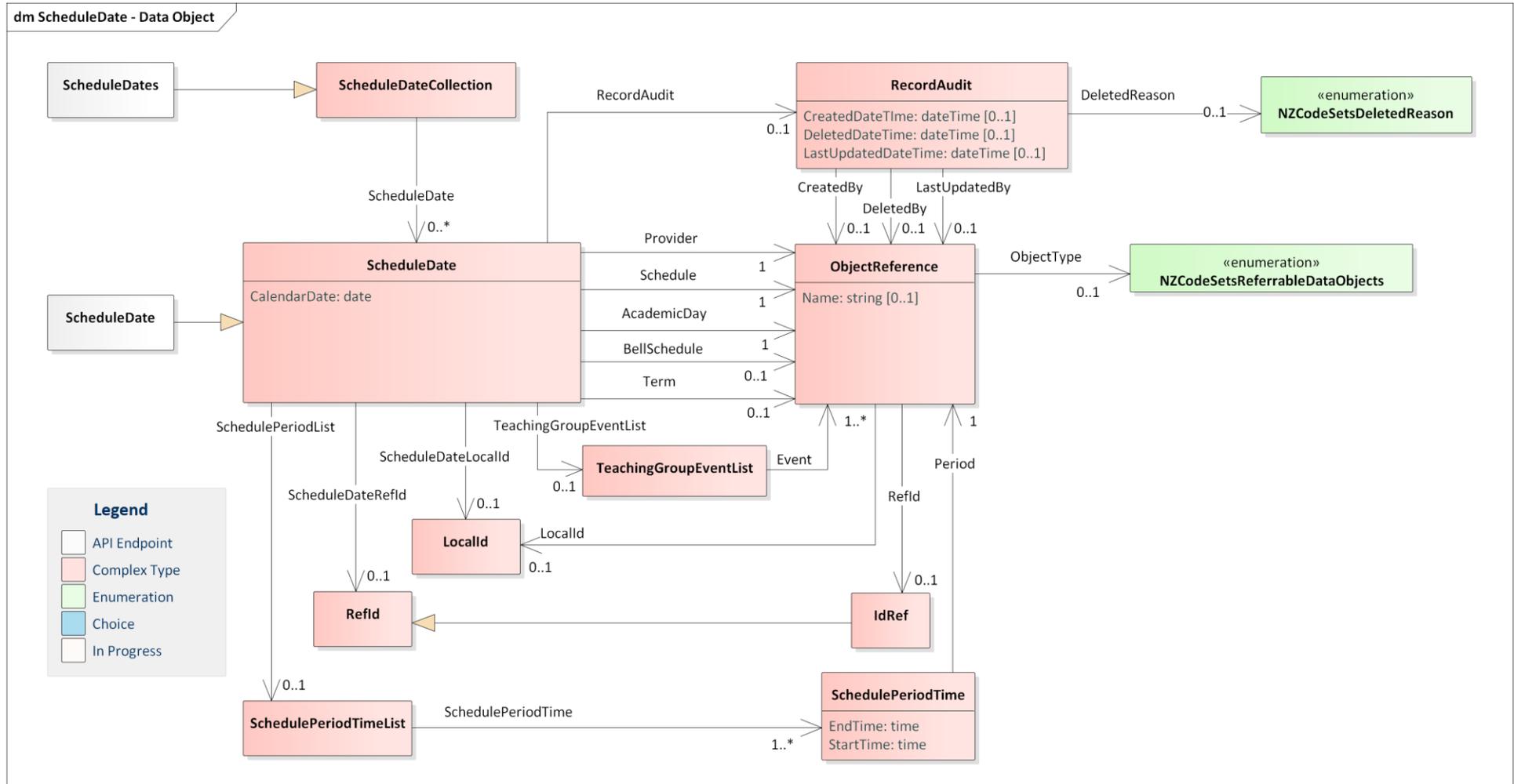


Figure 7: ScheduleDate Data Object

9 ScheduleEvent Data Object

Defines events that may or may not impact the schedule. These events may simply be for display, or may affect the school's academic schedule. This information is recorded using the ScheduleEvent data object (with matching API endpoints).

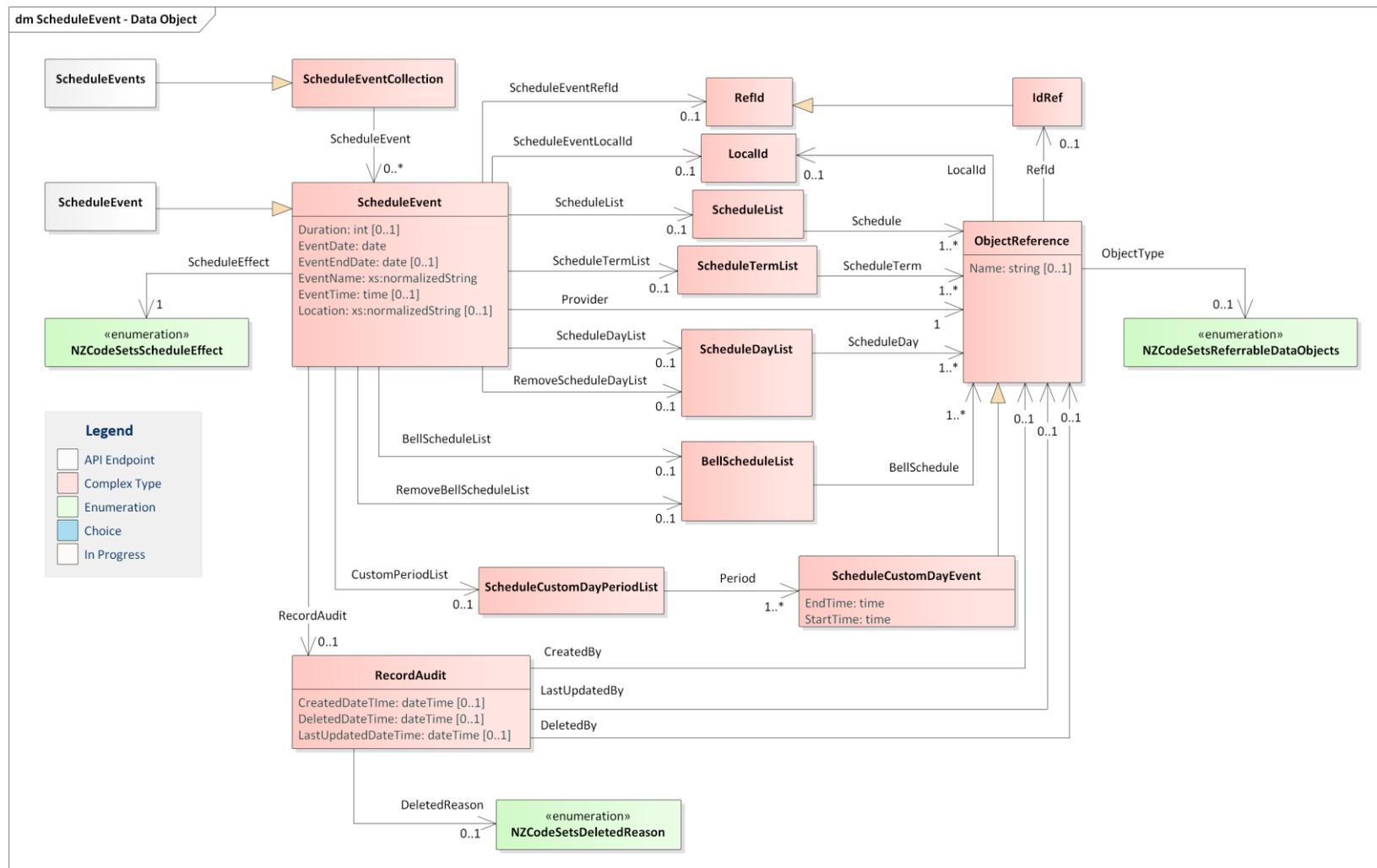


Figure 8: ScheduleEvent Data Object

10 ScheduleTerm Data Object

Provides information about school terms, tertiary terms etc., either at a national, or provider level, within a school year. If the term is being supplied at a national level, no provider information will be linked. This information is recorded using the ScheduleTerm data object (with matching API endpoints).

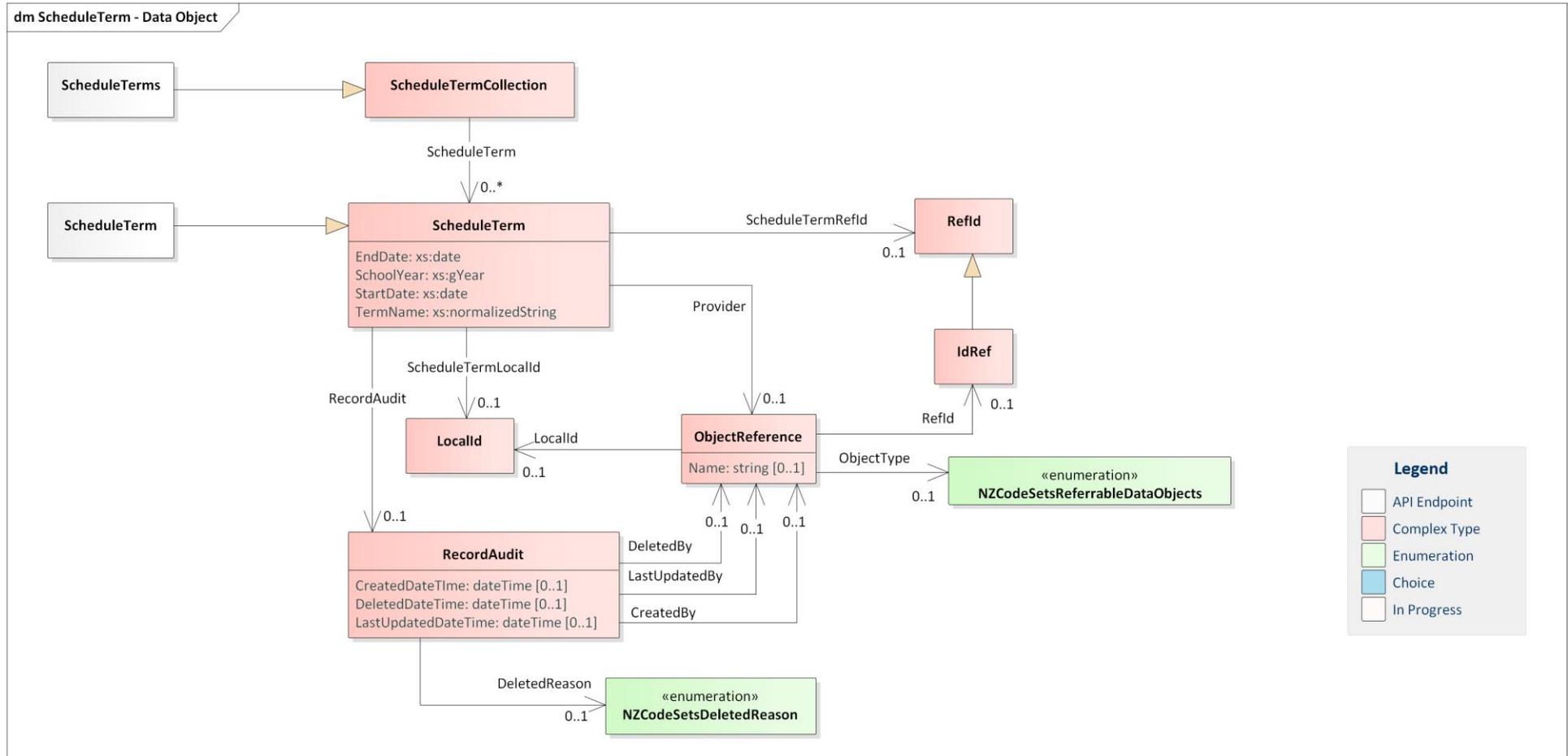


Figure 10: Schedule Term Data Object

11 ScheduleHoliday Data Object

Provides information about a holiday that may or may not impact upon the schedule of a provider. This information is recorded using the ScheduleHoliday data object (with matching API endpoints).

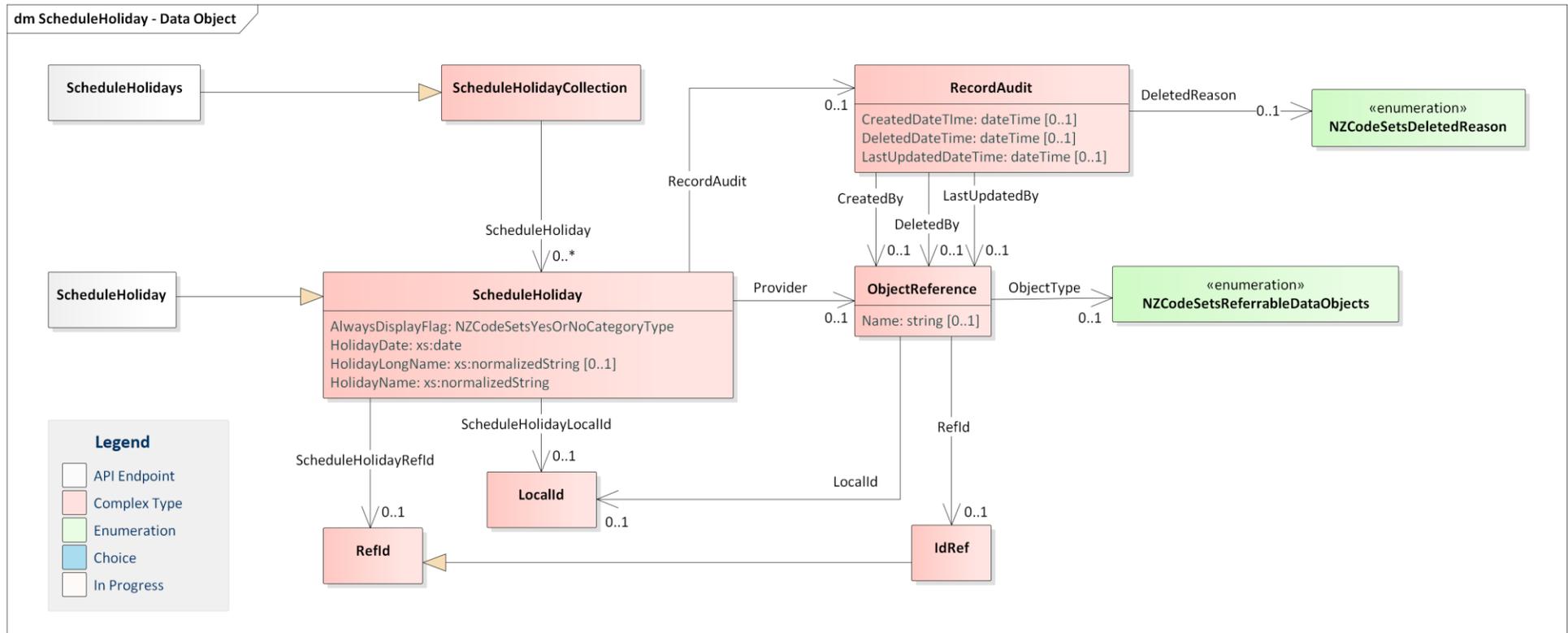


Figure 11: ScheduleHoliday Data Object

12 TeachingGroupEvent Data Object

Defines timetable events for teaching groups. These timetable events assign academic days and periods (defined in ScheduleDay and SchedulePeriod) to these objects that define what dates they meet in relation to the academic schedule. This information is recorded using the TeachingGroupEvent data object (with matching API endpoints).

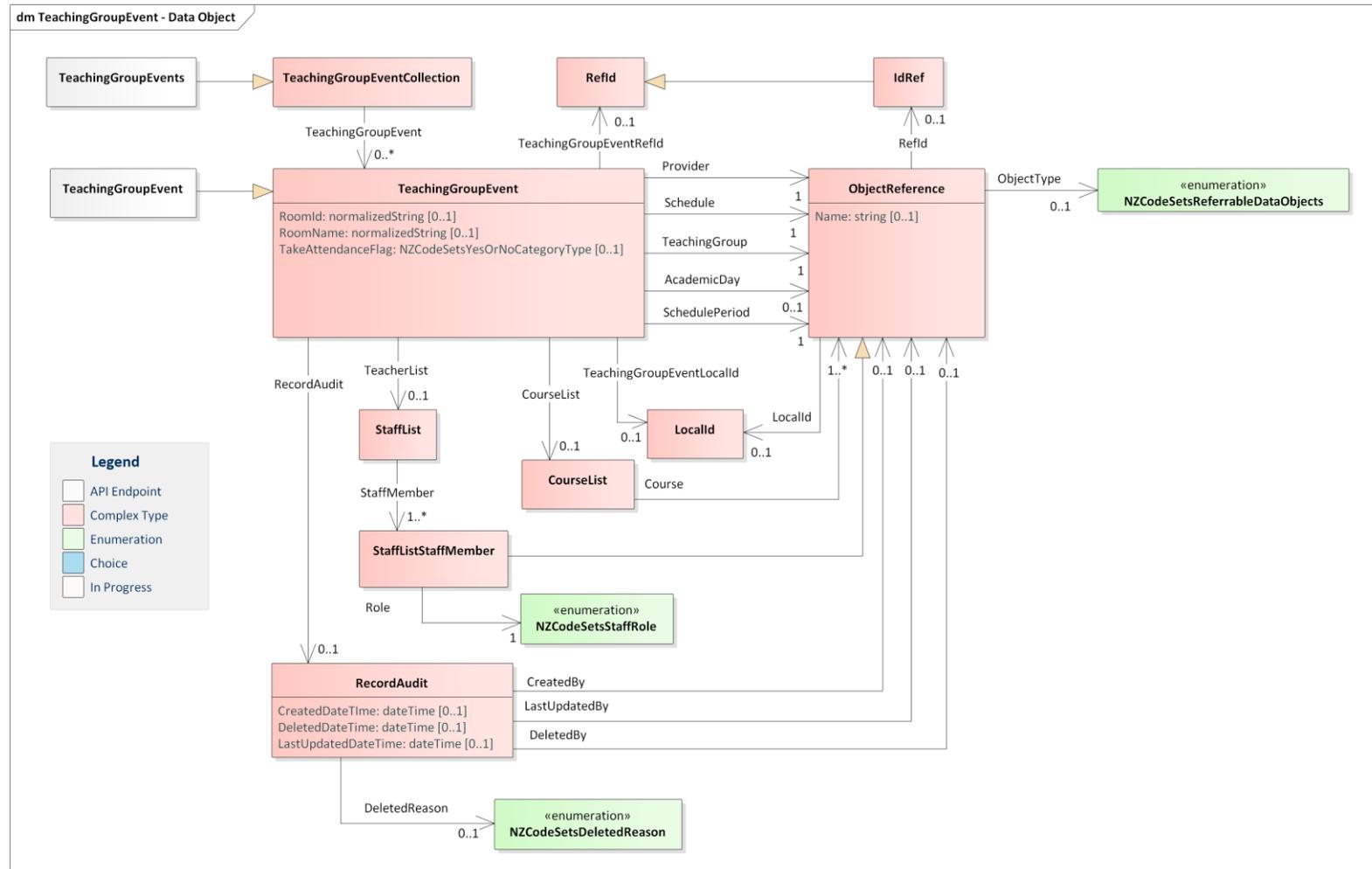


Figure 12: TeachingGroupEvent Data Object

13 Document Control

13.1 Amendment History

Version No	Description of Change	Changed By	Date
1.0	Document assembled from various working documents as part of SIF NZ Data Model v3.0 publication process.	Amy Orr and Stuart McGrigor	Jun/Jul 2019
1.1	Updated to match SIF NZ v3 (rc2). Names of Refld and LocalIds changed to be unique for each object. Fixed cardinality in data objects.	Amy Orr	19 Jul 2019
1.2	Updated to match SIF NZ v3 (rc2) and updated examples at the beginning of the document to show two concurrent schedules in place at a single school.	Amy Orr	5 Aug 2019
1.3	Updated all diagrams to match SIF NZ v3 (rc5).	Amy Orr	20 Nov 2019
1.4	Updated all diagrams to match SIF NZ v3 (rc7).	Stuart McGrigor	28 Feb 2020