Department for Transport

Title	Digital Traffic Regulation Orders: D-TRO Publication API Interface Control Document for Data Consumers
Author(s)	D-TRO Technical Team
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1 Document Control

1.1 Version History

Version	Author	Summary of changes	Date
2.0	PA Consulting	Record Management enhancement for D-TRO submission	01/07/2024
2.1	PA Consulting	Changes in the API endpoints	03/10/2024
2.2	PA Consulting	Adjust the Date Time format to match ISO 8601	28/10/2024

1.2 Document Review

Version	Reviewer(s)	Date
2.0	John Cooper (Department for Transport, Product Owner)	01/07/2024
2.1	John Cooper (Department for Transport, Product Owner)	10/10/2024
2.2	John Cooper (Department for Transport, Product Owner)	28/10/2024

1.3 Approved Versions

Version	Approver(s)	Date
2.0	Department for Transport	01/07/2024
2.1	Department for Transport	10/10/2024
2.2	Department for Transport	28/10/2024

2 Terms and Abbreviations

Term / Abbreviation	Definition
API	Application Programming Interface
CRUD	Create, Read, Update and Delete
CSO	Central Service Operator
DC	Data Consumer
DfT	Department for Transport
DSP	Digital Solution Provider
D-TRO	Digital Traffic Regulation Order
ICD	Interface Control Document
JSON	JavaScript Object Notation
TRA	Traffic Regulation Authority
TRO	Traffic Regulation Order
URI	Uniform Resource Identifier

3 Introduction

As part of its 'Future of Mobility: Urban Strategy', the Department for Transport (DfT) is modernising the regulatory framework for Traffic Regulation Orders (TROs) (Traffic Management Orders in London) made under the Road Traffic Regulation Act 1984.

The Automated Vehicles Act 2024 (section 93) provides statutory instruction for TRAs to provide information on a defined set of TROs, in a specified manner and form, to be provided in accordance with a specified model, standard or set of specifications. These will be the D-TRO Data Specification including the D-TRO Data Model, which are expected to be specified under secondary legislation.

The new regulatory framework will, subject to necessary secondary legislation coming into force, mandate that Traffic Regulation Authorities (TRAs) in England and Wales publish TROs as open data in a standardised and digital format that anyone can access, use and share.

The standardised digital format will be based on the Digital TRO (D-TRO) Data Specification that is described in this and other associated documents. This Data Specification is intended to be a free resource for all. The Data Specification is candidate in nature and may be subject to change without notification.

Taking into account the needs arising from the UK Industrial Strategy and recognising the requirements that will emerge from the deployment of Connected and Automated Vehicles (CAVs), this Data Specification provides a framework for how the data and information relating to TROs can be formed in the future. Availability of such a draft Data Specification, when suitably tested, will support the move towards TROs being easily accessible to the public whether using apps or driving connected vehicles.

4 Overview of Data Specification

This Interface Control Document (ICD) is part of the documents and artefacts that are available in connection to the D-TRO Service:

Documents and artefacts supporting the D-TRO Service

This is in conjunction with the initial Data Specification that has been released for Beta, including the technical user guide which outlines the data modelling concepts defined to help support the definition and exchange of information relating traffic regulations.

All the latest versions of documents and other artefacts of this release are listed in GitHub [https://github.com/department-for-transport-public/D-TRO/issues/1].

5   Scope of this document

This ICD specifies the design of the interface for the D-TRO Consume API. This API enables integration between TRA systems and central D-TRO Service for the purposes of allowing Data Consumers to:

- Retrieve D-TROs held by the D-TRO Service.
- Retrieve history of the D-TROs issued by the TRAs held by the D-TRO Service.
- Search events and record of the existing D-TROs held by the D-TRO Service.
- Retrieve, rules and schemas within the D-TRO Service.

6 Target Audience

The target audience of this document is Data Consumers who have a specific interest and need for D-TRO data. This may include, for example, SatNav and routing data suppliers or mapping applications.

7 Integration Architecture

7.1 Overview (API v1 methods)

The figure below depicts the 'happy path' sequence of interactions between Data Consumers and the D-TRO Service.
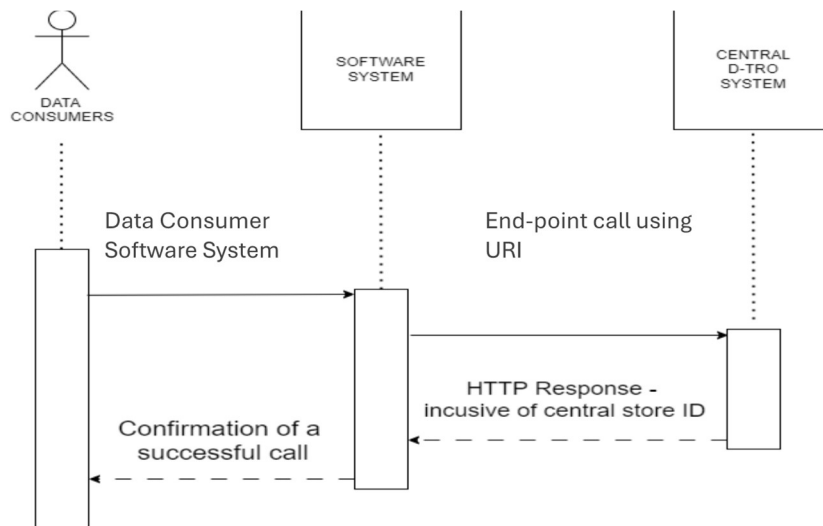
Expected API interactions

7.2 Design Principles

When integrating with this interface, the following design patterns and principles should be adopted to ensure that the non-functional characteristics of Data Consumer systems and the D-TRO Service are effectively implemented:

ID	Pattern / Principle	Description
DP01	Guaranteed delivery	Data Consumer systems must adopt an architecture that ensures guaranteed delivery of requests/responses to and from the D-TRO Service.
DP02	Loose coupling	Data Consumer systems must adopt an architecture that is loosely coupled from the D-TRO Service and can detect, respond to, and recover from exceptions where the D-TRO Service is unavailable.
DP03	GOV.UK API technical and data standards	The interface will comply with published GOV.UK API technical and data standards.

8 Assumptions, Constraints, Risks and Dependencies

8.1 Assumptions

ID	Assumption	Impact if not true
A01	Data Consumers will adopt an 'API-first' approach to integrate with the D-TRO API.	No web-based user interface is proposed to allow the retrieving and searching of D-TROs, schema, and rules.

8.2 Constraints

ID	Constraint
C01	Calls to the D-TRO Consume API will be subject to a quota constraining the number of requests that can be issued per second. Rate limiting values will be captured in future versions of this document.

8.3 Risks

ID	Risk	Impact	Mitigation
R01	There is a risk that the D-TRO Service is unavailable due to a technical fault or unplanned maintenance. (e.g., to address a critical security vulnerability identified in the underlying technology platform)	The operation of Data Consumer systems that integrates with the D-TRO Service will be correspondingly impacted.	Data Consumers will adopt the design patterns and policies specified in section 7 (see assumptions A01).

8.4 Dependencies

ID	Dependency
D01	Data Consumers will use credentials provided by the CSO to interact with the API.
D02	Data Consumer systems must be securely configured to manage API credentials.
D03	Data Consumer systems must adhere to the design patterns and policies specified in section 7.

9 Endpoints available for Data Consumers

The table below lists the endpoints relevant for this ICD. Additional endpoints for the TRAs/DSPs are documented in **Beta-01-DfT-D-TRO-Publishers-TRA-DSP**.

Ref.	HTTP verb	Endpoints	Name
		DTROs	
D5	GET	/v1/dtros/{id}	Retrieve a D-TRO by D-TRO ID
D7	GET	/v1/dtros/sourceHistory/{dtroId}	Retrieve source history based by D-TRO ID
D8	GET	/v1/dtros/provisionHistory/{dtroId}	Retrieve provisions history by D-TRO ID
		EVENTS AND SEARCH	
ES1	POST	/v1/events	Query central data store events (e.g., D-TRO being created, updated, or deleted)
ES2	POST	/v1/search	Find existing D-TROs that matches the specified criteria
		RULES	
R1	GET	/v1/rules/versions	Retrieve available rule versions
R2	GET	/v1/rules	Retrieve available rules
R3	GET	/v1/rules/{versions}	Retrieve rule by version
R4	GET	/v1/rules/{id}	Retrieve rule by ID
		SCHEMAS	
S1	GET	/v1/schemas/versions	Retrieve available schema versions
S2	GET	/v1/schemas	Retrieve available schema
S3	GET	/v1/schemas/{version}	Retrieve schema by version
S4	GET	/v1/schemas/{id}	Retrieve schema by ID

Summary of Data Consumer API endpoints

10 Interface Specification

This interface enables integration, via a RESTful API, for Data Consumers for the searching and retrieving of Digital Traffic Regulation Orders.

Overview	
Item	**Value**
Name	D-TRO Publication (API)
Publisher	Department for Transport
Consumer	Data Consumer
Interface type	☒ RESTful API ☐ SOAP API ☐ File transfer. ☐ Other (please specify)
Protocol	☐ HTTP ☒ HTTPS – must be HTTPS 1.1 or higher. ☐ Other (please specify)
Test URL	To be published shortly
Pre-Production URL	To published in a future revision of this document
Production URL	To published in a future revision of this document
Security Classification	☐ UNMARKED ☒ OFFICIAL ☐ OFFICIAL-SENSITIVE ☐ SECRET ☐ TOP SECRET
Authentication	Authentication to the application via the API endpoints for all public-facing environments (Third-party test and Production) will be controlled using the OAuth 2.0 framework (in keep with GOV.UK API technical and data standards). In order to obtain the necessary token, the user must either be onboarded as a DSP or cleared by the CSO before being allowed to self-register to use D-TRO via a portal and obtain the authentication token. It should be noted that for Private-Beta, IP restrictions will be in place, only allowing a select few addresses to call D-TRO API endpoints.
Content type	application/json
Content encoding	UTF-8

Overview	
Item	**Value**
Non-Repudiation	The use of OAuth 2.0 credentials paired with X-Correlation-ID headers will be used to uniquely identify an API invocation for non-repudiation purposes.

Notes applicable to all methods:

1. Dates and times – all date and time records shall be expressed in local time using the ISO 8601-1:2019 format (e.g. YYYY-MM-DDTHH:MM:SS).

2. Correlation identifier – all identifiers shall be expressed using UUID ISO/IEC 11578:1996 specification. The format consists of 32 hexadecimal digits plus 4 hyphens (8-4-4-4-12).

10.1 Endpoints D-TROs

The below methods are provisioned for retrieval of D-TRO records.

The tables below cover the following endpoints specific for D-TROs.

Ref.	Endpoints	Name
D5	/v1/dtros/{id}	Retrieve a D-TRO by D-TRO ID
D7	/v1/dtros/sourceHistory/{dtroId}	Retrieve source history based by D-TRO ID
D8	/v1/dtros/provisionHistory/{dtroId}	Retrieve provisions history by D-TRO ID

Reference	D5
Item	Value
GET	/v1/dtros/{id}
Name	Get a D-TRO by id
Description	This GET method allows Data Consumers to retrieve an existing D-TRO from the D-TRO Service, based on its unique identification.
Input data type(s)	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Input Structure	Header Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	X-Correlation-ID	string	36	36	Mandatory	UUID formatted string to track the request through the enquiries stack.
	Request Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	id	string	36	36	Mandatory	UUID formatted string containing the unique identification of a D-TRO.

Input data scope	When invoking this endpoint, the id parameter must contain a full UUID representation. If the unique identifier matches with one of the existing D-TROs within the D-TRO Service, that D-TRO will be retrieved.
Output data type	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Output data structure	Response Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	Data	JSON	-	-	Mandatory	D-TRO retrieved from the D-TRO Service.

Responses	

Reference	D5
Item	Value
GET	/v1/dtros/{id}
Name	Get a D-TRO by id
Description	This GET method allows Data Consumers to retrieve an existing D-TRO from the D-TRO Service, based on its unique identification.

200 OK	<pre>{
	    "schemaVersion": "3.2.4",
	    "data": {
	       "Source": {
	          "actionType": "new",
	          "currentTraOwner": 1000,
	          "provision": [{
	          …omitted for brevity (For a full example of D-TRO response please refer to GitHub File Index document at: Beta-01-DfT-D-TRO-001-GitHub File Index.docx)
	          }],
	          "reference": "B2787FE2-AD74-432A-BB32-76FDB065F3E8",
	          "section": "All sections",
	          "traAffected": [
	             1000
	          ]
	          "traCreator": 1000,
	          "troName": "The Sample County Council (Prohibition of Waiting, Loading and Stopping) and (on-Street Parking Places) (Civil Enforcement Area) Consolidation Order 2019."
	       }
	    }
	}</pre>

404 Not Found	<pre>{
	  "message": "Not found",
	  "errors": [
	    "D-TRO with id 3fa85f64-5717-4562-b3fc-2c963f66afa6 not found."
	  ]
	}</pre>

Error Codes	HTTP Code	Error Type
	400	Bad request
	403	Access denied/forbidden
	404	Not found
	405	Method not allowed
	429	Too many requests
	500	Internal Server Error
	502	Bad gateway
	503	Service unavailable
	504	Gateway timeout

Reference	D7
Item	Value
GET	/v1/dtros/sourceHistory/{dtroId}
Name	Get the source history of a D-TRO by id
Description	This GET method allows Data Consumers to retrieve source history of an existing D-TRO from the D-TRO Service, based on its unique identification.
Input data type(s)	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Input Structure	Header Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	X-Correlation-ID	string	36	36	Mandatory	UUID formatted string to track the request through the enquiries stack.
	Request Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	dtroId	string	36	36	Mandatory	UUID formatted string containing the unique identification of a D-TRO.

Input data scope	When invoking this endpoint, the dtroId parameter must contain a full UUID representation. If the unique identifier matches with one of the existing D-TROs within the D-TRO Service, that D-TRO will be retrieved.
Output data type	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Output data structure	Response Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	Data	JSON	-	-	Mandatory	D-TRO retrieved from the D-TRO Service.
Responses						

Reference	D7
Item	Value
GET	/v1/dtros/sourceHistory/{dtroId}
Name	Get the source history of a D-TRO by id
Description	This GET method allows Data Consumers to retrieve source history of an existing D-TRO from the D-TRO Service, based on its unique identification.

200 OK	[
	  {
	      "Source": {
	        "actionType": "amendment",
	        "currentTraOwner": 1000,
	        "provision": [{
	      …omitted for brevity (For full example of D-TRO source history response, please refer to GitHub File Index document at: Beta-01-DfT-D-TRO-001-GitHub File Index.docx)
	          }],
	        "reference": "B2787FE2-AD74-432A-BB32-76FDB065F3E8",
	        "section": "All sections",
	        "traAffected": [
	            1001
	        ],
	        "traCreator": 1000,
	        "troName": "The Sample County Council (Prohibition of Waiting, Loading and Stopping) and (on-Street Parking Places) (Civil Enforcement Area) Consolidation Order 2019."
	      }
	  },
	  {
	      "Source": {
	        "actionType": "new",
	        "currentTraOwner": 1000,
	        "provision": [{
	      …omitted for brevity (For full example of D-TRO source history response, please refer to GitHub File Index document at: Beta-01-DfT-D-TRO-001-GitHub File Index.docx)
	          }],
	        "reference": "B2787FE2-AD74-432A-BB32-76FDB065F3E8",
	        "section": "All sections",
	        "traAffected": [
	            1000
	        ],
	        "traCreator": 1000,
	        "troName": "The Sample County Council (Prohibition of Waiting, Loading and Stopping) and (on-Street Parking Places) (Civil Enforcement Area) Consolidation Order 2019."
	      }
	  }
	]

Reference	D7
Item	Value
GET	/v1/dtros/sourceHistory/{dtroId}
Name	Get the source history of a D-TRO by id
Description	This GET method allows Data Consumers to retrieve source history of an existing D-TRO from the D-TRO Service, based on its unique identification.

500 Internal Server Error	{
	  "message": "Internal Server Error",
	  "errors": [
	    "An unexpected error occurred."
	  ]
	}

Error Codes	HTTP Code	Error Type
	400	Bad request
	403	Access denied/forbidden
	404	Not found
	405	Method not allowed
	429	Too many requests
	500	Internal Server Error
	502	Bad gateway
	503	Service unavailable
	504	Gateway timeout

Reference	D8
Item	Value
GET	/v1/dtros/provisionHistory/{dtroId}
Name	Get the provisions history of a D-TRO
Description	This GET method allows Data Consumers retrieve provisions history of an existing D-TRO from the D-TRO Service, based on its unique identification.
Input data type(s)	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Input Structure	Header Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	X-Correlation-ID	string	36	36	Mandatory	UUID formatted string to track the request through the enquiries stack.
	Request Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	dtroId	string	36	36	Mandatory	UUID formatted string containing the unique identification of a D-TRO.

Input data scope	When invoking this endpoint, the dtroId parameter must contain a full UUID representation. If the unique identifier matches with one of the existing D-TROs within the D-TRO Service, that D-TRO will be retrieved.
Output data type	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Output data structure	Response Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	Data	JSON	-	-	Mandatory	D-TRO retrieved from the D-TRO Service.
Responses						

200 OK	A textual description of the response containing all versions of the referenced D-TRO currently held in the D-TRO Central Service are returned.

	[
	{
	   "actionType": "partialRevoke",
	   "orderReportingPoint": "ttroTtmoByNotice",
	   "provisionDescription": "Prohibition of Waiting",
	   "reference": "A3448229-1DFA-48CD-A785-376ACB9F7C56",
	   "regulation": [
	     …omitted for brevity (For full example of D-TRO provision history response, please refer to GitHub File Index document at: <u>Beta-01-DfT-D-TRO-001-GitHub File Index.docx</u>)
	    }
	    "regulatedPlace": [
	     …omitted for brevity (For full example of D-TRO provision history response, please refer to GitHub File Index document at: <u>Beta-01-DfT-D-TRO-001-GitHub File Index.docx</u>)
	    }
	  ],
	},
	{
	   "actionType": "fullRevoke",
	   "orderReportingPoint": "ttroTtmoByNotice",
	   "provisionDescription": "Prohibition of Waiting",
	   "reference": "A3448229-1DFA-48CD-A785-376ACB9F7C56",
	   "regulation": [
	     …omitted for brevity (For full example of D-TRO provision history response, please refer to GitHub File Index document at: <u>Beta-01-DfT-D-TRO-001-GitHub File Index.docx</u>)
	    }
	    "regulatedPlace": [
	     …omitted for brevity (For full example of D-TRO provision history response, please refer to GitHub File Index document at: <u>Beta-01-DfT-D-TRO-001-GitHub File Index.docx</u>)
	    }
	  ],
	},
	{
	   "actionType": "new",
	   "orderReportingPoint": "ttroTtmoByNotice",
	   "provisionDescription": "Prohibition of Waiting",
	   "reference": "A3448229-1DFA-48CD-A785-376ACB9F7C56",
	   "regulation": [
	     …omitted for brevity (For full example of D-TRO provision history response, please refer to GitHub File Index document at: <u>Beta-01-DfT-D-TRO-001-GitHub File Index.docx</u>)
	    }
	    "regulatedPlace": [
	     …omitted for brevity (For full example of D-TRO provision history response, please refer to GitHub File Index document at: <u>Beta-01-DfT-D-TRO-001-GitHub File Index.docx</u>)
	    }
	  ],
	}
	]

Reference	D8
Item	Value
GET	/v1/dtros/provisionHistory/{dtroId}
Name	Get the provisions history of a D-TRO
Description	This GET method allows Data Consumers retrieve provisions history of an existing D-TRO from the D-TRO Service, based on its unique identification.

500 Internal Server Error	{
	  "message": "Internal Server Error",
	  "errors": [
	    "An unexpected error occurred."
	  ]
	}

Error Codes	HTTP Code	Error Type
	400	Bad request
	403	Access denied/forbidden
	404	Not found
	405	Method not allowed
	429	Too many requests
	500	Internal Server Error
	502	Bad gateway
	503	Service unavailable
	504	Gateway timeout

10.2 Events and Search

Ref.	Endpoints	Name
ES1	/v1/events	Query central data for stored events
ES2	/v1/search	Find existing D-TROs that matches requested criteria.

Reference	ES1					
Item	Value					
POST	/v1/events					
Name	Query central data for stored events (e.g., D-TROs being created, updated, or deleted).					
Description	This POST method allows Data Consumers to query events (created, updated, or deleted) on existing D-TROs within the D-TRO Service.					
Input data type(s)	☑ JSON ☒ XML ☒ File ☒ Other (please specify)					
Input Structure	Header Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	X-Correlation-ID	string	36	36	Mandatory	UUID formatted string to track the request through the enquiries stack.
	Request Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	data	object	1KB	10MB	Mandatory	A JSON payload describing a D-TRO. Payload should be UTF8 encoded.

Reference	ES1
Item	Value
POST	/v1/events
Name	Query central data for stored events (e.g., D-TROs being created, updated, or deleted).
Description	This POST method allows Data Consumers to query events (created, updated, or deleted) on existing D-TROs within the D-TRO Service.

Input data scope	When invoking this endpoint, the request payload must contain a search query object 'page', 'pageSize' and 'since' as mandatory fields and at least one other property of your choice (e.g. traCreator)
	
	{
	  "page": 1,
	  "pageSize": 50,
	  "since": "2020-10-07T08:14:41",
	  "traCreator": 0,
	  "currentTraOwner": 0,
	  "troName": "The Sample County Council (Prohibition of Waiting, Loading and Stopping) and (on-Street Parking Places) (Civil Enforcement Area) Consolidation Order 2019.",
	  "regulationType": "string",
	  "vehicleType": "string",
	  "orderReportingPoint": "string",
	  "regulationStart": {
	    "operator": ">=",
	    "value": "2024-10-07T08:00:00"
	  },
	  "regulationEnd": {
	    "operator": "<=",
	    "value": "2024-10-08T08:00:00"
	  }
	}

Output data type	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Output data structure	Response Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	id	string	36	36	Mandatory	UUID formatted string containing a D-TRO Service identifier for the newly created D-TRO record.

Responses	

200 OK	{
	  "events": [],
	  "page": 1,
	  "pageSize": 0,
	  "totalCount": 0
	}

Reference	ES1
Item	Value
POST	/v1/events
Name	Query central data for stored events (e.g., D-TROs being created, updated, or deleted).
Description	This POST method allows Data Consumers to query events (created, updated, or deleted) on existing D-TROs within the D-TRO Service.

404 Not Found	{
	  "message": "Not found",
	  "errors": [
	    "Schema version not found."
	  ]
	}

400 Bad Request	{
	  "errors": {
	    property: [
	      "Unexpected end when deserializing object. Path *property*."
	    ]
	  },
	  "type": "https://tools.ietf.org/html/rfc7231#section-6.5.1",
	  "title": "One or more validation errors occurred.",
	  "status": 400,
	  "traceId": "00-9f4aa677608b15827106b63502eb806f-ca691cf133c8871d-00"
	}

Error Codes	HTTP Code	Error Type
	400	Bad request
	403	Access denied/forbidden
	404	Not found
	405	Method not allowed
	429	Too many requests
	500	Internal Server Error
	502	Bad gateway
	503	Service unavailable
	504	Gateway timeout

Reference	ES2
Item	Value
POST	/v1/search
Name	Find existing D-TROs that matches requested criteria.
Description	This POST method allows Data Consumers to query D-TROs that matches certain criteria within the D-TRO Service.
Input data type(s)	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Input Structure	Header Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	X-Correlation-ID	string	36	36	Mandatory	UUID formatted string to track the request through the enquiries stack.
	Request Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	data	object	1KB	10MB	Mandatory	An object containing an array of queries to search. Payload should be UTF8 encoded.

Reference	ES2
Item	Value
POST	/v1/search
Name	Find existing D-TROs that matches requested criteria.
Description	This POST method allows Data Consumers to query D-TROs that matches certain criteria within the D-TRO Service.

Input data scope	When invoking this endpoint, the request payload must contain a search query object '**page**' and '**pageSize**' as mandatory fields and at least one other property of your choice withing the queries array (e.g. troName)
	
	{
	  "queries": [
	    {
	      "publicationTime": "2024-10-07T12:22:01",
	      "modificationTime": "2024-10-07T12:22:01",
	      "deletionTime": "2024-10-07T12:22:01",
	      "traCreator": 0,
	      "currentTraOwner": 0,
	      "troName": "string",
	      "regulationType": "string",
	      "vehicleType": "string",
	      "orderReportingPoint": "string",
	      "regulationStart": {
	        "operator": ">=",
	        "value": "2024-10-07T08:00:00"
	      },
	      "regulationEnd": {
	        "operator": "<=",
	        "value": "2024-10-08T08:00:00"
	      }
	    }
	  ],
	  "page": 1,
	  "pageSize": 50
	}

Output data type	☑ JSON ☒ XML ☒ File ☒ Other (please specify)
Output data structure	Response Parameters

Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
data	JSON array	-	-	Mandatory	Result array

Responses	

Reference	ES2
Item	Value
POST	/v1/search
Name	Find existing D-TROs that matches requested criteria.
Description	This POST method allows Data Consumers to query D-TROs that matches certain criteria within the D-TRO Service.

200 OK (with content result)	{
	  "results": [
	    {
	For an example of a D-TRO search, please refer to GitHub File Index document at: Beta-01-DfT-D-TRO-001-GitHub File Index.docx)
	      "vehicleType": [
	       "taxi"
	      ],
	For an example of a D-TRO search, please refer to GitHub File Index document at: Beta-01-DfT-D-TRO-001-GitHub File Index.docx)
	  "page": 1,
	  "pageSize": 1,
	  "totalCount": 1
	}

200 OK (with null result)	{
	  "results": [],
	  "page": 1,
	  "pageSize": 0,
	  "totalCount": 0
	}

500 Internal Server Error	{
	  "message": "Internal Server Error",
	  "errors": [
	    "An unexpected error occurred."
	  ]
	}

Error Codes	HTTP Code	Error Type
	400	Bad request
	403	Access denied/forbidden
	404	Not found
	405	Method not allowed
	429	Too many requests
	500	Internal Server Error
	502	Bad gateway
	503	Service unavailable
	504	Gateway timeout

10.3 Rules

Ref.	Endpoints	Name
R1	/v1/rules/versions	Retrieve available rule versions
R2	/v1/rules	Retrieve available rules
R3	/v1/rules/{versions}	Retrieve rule by version
R4	/v1/rules/{id}	Retrieve rule by id

Reference	R1					
Item	Value					
GET	/v1/rules/versions					
Name	Get available rule versions[1]					
Description	This GET method allows Data Consumers to retrieve rule versions from the D-TRO Service.					
Input data type(s)	☑ JSON ☒ XML ☒ File ☒ Other (please specify)					
Input Structure	Header Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	X-Correlation-ID	string	36	36	Mandatory	UUID formatted string to track the request through the enquiries stack.
	Request Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	-	-	-	-	-	-
Input data scope	-					
Output data type	☑ JSON ☒ XML ☒ File ☒ Other (please specify)					
Output data structure	Response Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	Data	JSON	-	-	Mandatory	Array containing JSON objects

---

[1] **Rules Template**: Defines logical conditions (rule) that data must satisfy within specific paths (path) of the DTRO. It is used to enforce business rules, validation criteria, or complex data relationships.

Reference	R1
Item	Value
GET	/v1/rules/versions
Name	Get available rule versions[1]
Description	This GET method allows Data Consumers to retrieve rule versions from the D-TRO Service.
Responses	
200 OK	```[{ "schemaVersion": "3.2.4" }]```
500 Internal Server Error	```{ "message": "Internal Server Error", "errors": ["An unexpected error occurred."] }```

Error Codes	HTTP Code	Error Type
	400	Bad request
	403	Access denied/forbidden
	404	Not found
	405	Method not allowed
	429	Too many requests
	500	Internal Server Error
	502	Bad gateway
	503	Service unavailable
	504	Gateway timeout

Reference	R2
Item	Value
GET	/v1/rules
Name	Get available rules
Description	This GET method allows Data Consumers to retrieve rules from the D-TRO Service.
Input data type(s)	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Input Structure	Header Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	X-Correlation-ID	string	36	36	Mandatory	UUID formatted string to track the request through the enquiries stack.
	Request Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	-	-	-	-	-	-

Input data scope	-
Output data type	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Output data structure	Response Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	Data	JSON	-	-	Mandatory	Array containing JSON objects

Responses	

Reference	R2
Item	Value
GET	/v1/rules
Name	Get available rules
Description	This GET method allows Data Consumers to retrieve rules from the D-TRO Service.

200 OK	`[`
	  `{`
	    `"schemaVersion": "3.2.1",`
	    …omitted for brevity (For an example of Rule response, please refer to GitHub File Index document at: Beta-01-DfT-D-TRO-001-GitHub File Index.docx)
	  `},`
	  `{`
	    `"schemaVersion": "3.2.4",`
	    `"template": [`
	      `{`
	        `"id": 1,`
	        `"message": "weekInMonth instances must be unique.",`
	        `"name":`
	`"ExceptionPeriodApplicableInstanceDayWithinMonthInstancesUnique"`
	        `"path":`
	`"Source.provision.regulation.timeValidity.exceptionPeriod.recurringDayWeekMonthPeriod.applicableInstanceOfDayWithinMonth"`
	        `"rule": {`
	        …omitted for brevity (For an example of Rule response, please refer to GitHub File Index document at: Beta-01-DfT-D-TRO-001-GitHub File Index.docx)
	      `},`
	      …omitted for brevity (For an example of Rule response, please refer to GitHub File Index document at: Beta-01-DfT-D-TRO-001-GitHub File Index.docx)
	  `}`
	    `]`
	  `}`
	`]`

500 Internal Server Error	`{`
	  `"message": "Internal Server Error",`
	  `"errors": [`
	    `"An unexpected error occurred."`
	  `]`
	`}`

Error Codes	HTTP Code	Error Type
	400	Bad request
	403	Access denied/forbidden
	404	Not found
	405	Method not allowed
	429	Too many requests
	500	Internal Server Error
	502	Bad gateway
	503	Service unavailable
	504	Gateway timeout

Reference	R3
Item	Value
GET	/v1/rules/{version}
Name	Get available rule by version
Description	This GET method allows Data Consumers to retrieve rule from the D-TRO Service.
Input data type(s)	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Input Structure	Header Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	X-Correlation-ID	string	36	36	Mandatory	UUID formatted string to track the request through the enquiries stack.
	Request Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	version	string	5	5	Mandatory	String representation of rule version

Input data scope	When invoking this endpoint, the request parameter must be a string in this format: {Major}.{Minor}.{Patch}.
Output data type	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Output data structure	Response Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	Data	JSON	-	-	Mandatory	Array containing JSON objects
Responses						

Reference	R3
Item	Value
GET	/v1/rules/{version}
Name	Get available rule by version
Description	This GET method allows Data Consumers to retrieve rule from the D-TRO Service.

200 OK	<pre>{
	    "schemaVersion": "3.2.4",
	    "template": [
	      {
	        "id": 1,
	        "message": "weekInMonth instances must be unique.",
	        "name":
	"ExceptionPeriodApplicableInstanceDayWithinMonthInstancesUnique"
	        "path":
	"Source.provision.regulation.timeValidity.exceptionPeriod.recurringDayWeekMonthPeriod.applicableInstanceOfDayWithinMonth"
	        "rule": {
	          …omitted for brevity (For an example of Rule response, please refer to GitHub File Index document at: Beta-01-DfT-D-TRO-001-GitHub File Index.docx)
	        },
	          …omitted for brevity (For an example of Rule response, please refer to GitHub File Index document at: Beta-01-DfT-D-TRO-001-GitHub File Index.docx)
	      }
	    ]
	}</pre>

500 Internal Server Error	<pre>{
	  "message": "Internal Server Error",
	  "errors": [
	    "An unexpected error occurred."
	  ]
	}</pre>

Error Codes	HTTP Code	Error Type
	400	Bad request
	403	Access denied/forbidden
	404	Not found
	405	Method not allowed
	429	Too many requests
	500	Internal Server Error
	502	Bad gateway
	503	Service unavailable
	504	Gateway timeout

Reference	R4
Item	Value
GET	/v1/rules/{id}
Name	Get available rule by unique identifier
Description	This GET method allows Data Consumers to retrieve rule from the D-TRO Service.
Input data type(s)	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Input Structure

Header Parameters

Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
X-Correlation-ID	string	36	36	Mandatory	UUID formatted string to track the request through the enquiries stack.

Request Parameters

Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
id	string	36	36	Mandatory	UUID formatted string representing the rule to be retrieved.

Input data scope	When invoking this endpoint, the id parameter must be string in UUID format.
Output data type	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Output data structure

Response Parameters

Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
Data	JSON	-	-	Mandatory	Array containing JSON objects

Responses	

Reference	R4
Item	Value
GET	/v1/rules/{id}
Name	Get available rule by unique identifier
Description	This GET method allows Data Consumers to retrieve rule from the D-TRO Service.
200 OK	``` { "schemaVersion": "3.2.4", "template": [{ "id": 1, "message": "weekInMonth instances must be unique.", "name": "ExceptionPeriodApplicableInstanceDayWithinMonthInstancesUnique" "path": "Source.provision.regulation.timeValidity.exceptionPeriod.recurringDayWeekMonthPeriod.applicableInstanceOfDayWithinMonth" "rule": { …omitted for brevity (For an example of Rule response, please refer to GitHub File Index document at: Beta-01-DfT-D-TRO-001-GitHub File Index.docx) }, …omitted for brevity (For an example of Rule response, please refer to GitHub File Index document at: Beta-01-DfT-D-TRO-001-GitHub File Index.docx) }] } ```
500 Internal Server Error	``` { "message": "Internal Server Error", "errors": ["An unexpected error occurred."] } ```

Error Codes	HTTP Code	Error Type
	400	Bad request
	403	Access denied/forbidden
	404	Not found
	405	Method not allowed
	429	Too many requests
	500	Internal Server Error
	502	Bad gateway
	503	Service unavailable
	504	Gateway timeout

10.4 Schemas

Ref.	Endpoints	Name
S1	/v1/schemas/versions	Retrieve available schema versions
S2	/v1/schemas	Retrieve available schemas
S3	/v1/schemas/{versions}	Retrieve schema by version
S4	/v1/schemas/{id}	Retrieve schema by id

Reference	S1					
Item	Value					
GET	/v1/schemas/versions					
Name	Get available schema versions[2]					
Description	This GET method allows Data Consumers to retrieve schema versions from the D-TRO Service.					
Input data type(s)	☑ JSON ☒ XML ☒ File ☒ Other (please specify)					
Input Structure	Header Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	X-Correlation-ID	string	36	36	Mandatory	UUID formatted string to track the request through the enquiries stack.
	Request Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	-	-	-	-	-	-
Input data scope	-					
Output data type	☑ JSON ☒ XML ☒ File ☒ Other (please specify)					
Output data structure	Response Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	Data	JSON	-	-	Mandatory	Array containing JSON objects
Responses						

---

[2] **Schema Template**: Specifies the expected structure, data types, and constraints (type, minimum, maximum, etc.) for each field within the DTRO. It ensures consistency, integrity, and compatibility of data across systems or processes.

Reference	S1
Item	Value
GET	/v1/schemas/versions
Name	Get available schema versions[2]
Description	This GET method allows Data Consumers to retrieve schema versions from the D-TRO Service.

200 OK	<pre>[
	  {
	    "schemaVersion": "3.2.4",
	    "isActive": true,
	    "rulesExist": true
	  }
	]</pre>

500 Internal Server Error	<pre>{
	  "message": "Internal Server Error",
	  "errors": [
	    "An unexpected error occurred."
	  ]
	}</pre>

Error Codes	HTTP Code	Error Type
	400	Bad request
	403	Access denied/forbidden
	404	Not found
	405	Method not allowed
	429	Too many requests
	500	Internal Server Error
	502	Bad gateway
	503	Service unavailable
	504	Gateway timeout

Reference	S2
Item	Value
GET	/v1/schemas
Name	Get available schemas
Description	This GET method allows Data Consumers to retrieve schemas from the D-TRO Service.
Input data type(s)	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Input Structure	Header Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	X-Correlation-ID	string	36	36	Mandatory	UUID formatted string to track the request through the enquiries stack.
	Request Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	-	-	-	-	-	-

Input data scope	-
Output data type	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Output data structure	Response Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	Data	JSON	-	-	Mandatory	Array containing JSON objects

Responses	
200 OK	

```
[
    {
        "schemaVersion": "3.2.4",
        "template": {
            …omitted for brevity (For an example of Schema response, please refer
    to GitHub File Index document at: Beta-01-DfT-D-TRO-001-GitHub File
    Index.docx)
        },
        "isActive": true
    },
    {
        "schemaVersion": "3.2.0",
        "template": {
            …omitted for brevity (For an example of Schema response, please refer
    to GitHub File Index document at: Beta-01-DfT-D-TRO-001-GitHub File
    Index.docx)
        },
        "isActive": false
    }
]
```

Reference	S2
Item	Value
GET	/v1/schemas
Name	Get available schemas
Description	This GET method allows Data Consumers to retrieve schemas from the D-TRO Service.

500 Internal Server Error	{
	  "message": "Internal Server Error",
	  "errors": [
	    "An unexpected error occurred."
	  ]
	}

Error Codes	HTTP Code	Error Type
	400	Bad request
	403	Access denied/forbidden
	404	Not found
	405	Method not allowed
	429	Too many requests
	500	Internal Server Error
	502	Bad gateway
	503	Service unavailable
	504	Gateway timeout

Reference	S3
Item	Value
GET	/v1/schemas/{version}
Name	Get available schema by version
Description	This GET method allows Data Consumers to retrieve schema from the D-TRO Service.
Input data type(s)	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Input Structure	Header Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	X-Correlation-ID	string	36	36	Mandatory	UUID formatted string to track the request through the enquiries stack.
	Request Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	version	string	5	5	Mandatory	String representation of schema version

Input data scope	When invoking this endpoint, the request parameter must be string in this format: {Major}.{Minor}.{Patch}.
Output data type	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Output data structure	Response Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	Data	JSON	-	-	Mandatory	Array containing JSON objects

200 OK	<pre>{
	    "schemaVersion": "3.2.4",
	    "template": {
	        "type": "object",
	        "$defs": {
	            …omitted for brevity (For an example of Schema response, please refer to GitHub File Index document at: Beta-01-DfT-D-TRO-001-GitHub File Index.docx)
	            },
	        "oneOf": [
	            …omitted for brevity (For an example of Schema response, please refer to GitHub File Index document at: Beta-01-DfT-D-TRO-001-GitHub File Index.docx)
	            ],
	        "$schema": "https://json-schema.org/draft/2020-12/schema",
	        "description": "DTRO v3.2.4 data model JSON schema",
	        "additionalProperties": true
	    },
	    "isActive": true
	}</pre>

Reference	S3
Item	Value
GET	/v1/schemas/{version}
Name	Get available schema by version
Description	This GET method allows Data Consumers to retrieve schema from the D-TRO Service.
Responses	

500 Internal Server Error	{
	  "message": "Internal Server Error",
	  "errors": [
	    "An unexpected error occurred."
	  ]
	}

Error Codes	HTTP Code	Error Type
	400	Bad request
	403	Access denied/forbidden
	404	Not found
	405	Method not allowed
	429	Too many requests
	500	Internal Server Error
	502	Bad gateway
	503	Service unavailable
	504	Gateway timeout

Reference	S4
Item	Value
GET	/v1/schemas/{id}
Name	Get available schema by unique identifier.
Description	This GET method allows Data Consumers to retrieve schema from the D-TRO Service.
Input data type(s)	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Input Structure	Header Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	X-Correlation-ID	string	36	36	Mandatory	UUID formatted string to track the request through the enquiries stack.
	Request Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	id	string	36	36	Mandatory	UUID formatted string representation of schema unique identifier.

Input data scope	When invoking this endpoint, the request parameter must be string in UUID format.
Output data type	☑ JSON ☒ XML ☒ File ☒ Other (please specify)

Output data structure	Response Parameters					
	Field Name	Data Type	Min Length	Max Length	Opportunity	Notes
	Data	JSON	-	-	Mandatory	Array containing JSON objects

Reference	S4
Item	Value
GET	/v1/schemas/{id}
Name	Get available schema by unique identifier.
Description	This GET method allows Data Consumers to retrieve schema from the D-TRO Service.

200 OK	"schemaVersion": "3.2.4",
	"template": {
	    "type": "object",
	    "$defs": {
	        …omitted for brevity (For an example of Schema response, please refer to GitHub File Index document at: Beta-01-DfT-D-TRO-001-GitHub File Index.docx)
	        },
	    "oneOf": [
	        …omitted for brevity (For an example of Schema response, please refer to GitHub File Index document at: Beta-01-DfT-D-TRO-001-GitHub File Index.docx)
	        ],
	    "$schema": "https://json-schema.org/draft/2020-12/schema",
	    "description": "DTRO v3.2.4 data model JSON schema",
	    "additionalProperties": true
	},
	"isActive": true
	}

Responses	

500 Internal Server Error	{
	  "message": "Internal Server Error",
	  "errors": [
	    "An unexpected error occurred."
	  ]
	}

Error Codes	HTTP Code	Error Type
	400	Bad request
	403	Access denied/forbidden
	404	Not found
	405	Method not allowed
	429	Too many requests
	500	Internal Server Error
	502	Bad gateway
	503	Service unavailable
	504	Gateway timeout