

**BRAMS to BaSE SAP WebService**

**Business Layer to Integration Layer Design**

**Version 0.0**

**March 2014**



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Version Control

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Reference Documents:

High Level Design – v1.0: A high level overview of the integration requirements.

# Introduction

# High Level Requirements

The high level Design document established that the main objected of this project is to provide some level of integration between the BRAMS Exor System and the BaSE SAP System. The reason for doing this is to ensure that the linear assets in BRAMS and certain characteristics are updated to BaSE SAP with the use of a WebService.

During high level discussions it was determined that certain characteristics should be tracked and updated for the network types of: Road, Footpath, Kerb and Channel, and Median.

The characteristics that need to be tracked are:

* Condition\_suburb\_level
* Ward\_name
* Region
* Asset\_owner
* Suburb\_name
* Paved\_surface\_material\_source (only for footpath)

If any characteristic or the network has changes all of the information will be returned in the output.

# Data Input

* Description of the webservice, particularly the input parameters.

A database procedure will then be called to perform data processing.

# Data Processing

## Details of data being tracked

A PLSQL package will be created to perform the data processing required and to generate the required output data.

The Exor System will provide a list of changes to various networks and Characteristics of those networks. The Network types being tracked are:

|  |  |  |
| --- | --- | --- |
| **Network Name** | **BRAMS Exor**  **Internal Name** | **Comments** |
| Road | ROCO |  |
| Footpath | VECO |  |
| Kerb and Channel | KCOR |  |
| Median | MED\* | \*This Network does not physically exist in the BRAMS Exor system. It is a “Virtual” copy of the Road Network with 999 appended to the beginning of the BRAMS Object ID |

The Characteristics of each of the above network types being tracked are:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Characteristic Name** | **BRAMS Exor**  **Asset Name** | **Column** | **XSP if applicable** | **Comments** |
| Condition\_suburb\_level | N/A |  |  | Not in BRAMS |
| Ward\_name | OPWD | Ward name or number, exact unknown |  |  |
| Region | OPWD | LAS Region |  |  |
| Asset\_owner | ASOW | Asset Owner |  |  |
| Suburb\_name |  |  |  |  |
| Paved\_surface\_material\_source | PAVE | Paved Surface Material Source’ |  | (only for footpath)  Might not be needed |

Note: If the BRAMS Exor Asset Name is blank that means that the characteristic is part of the network at the lowest level and retrievable from there.

## Data Output from BRAMS

The output data should contain the following information:

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Type** | **Size** | **Description** |
| INDICATOR | CHAR (upper) | 1 | Values include   * I   + This indicates that the Item listed in that row was inserted into BRAMS * D   + This indicates that the Item listed in that row was End Dated in BRAMS and therefore no longer logically exists * C   + This indicates that the Item listed in that something in for the record in this row was changed in BRAMS |
| BRAMS ID | Number | 10 | Network ID for the system |
| OBJECT | CHAR (upper) | 30 | This includes the object/asset type, such as ROAD, FOOTPATH, KERB and MEDIAN, or the Characteristic type for the objects. See above section for list of characteristics |
| NAME | CHAR(upper) | 30 | This is the value of the characteristic that has changed |
| START | NUMBER | 18,2 | This is start point of the asset ID. The unit will as specified in BRAMS |
| END | NUMBER | 18,2 | This is the end point of the asset ID. The unit will be as specified in BRAMS |

The Start and End Columns will contain the homogeneous locations of characteristics along the object corridor. i.e. neighboring characteristics holding the same value will be combined and reported only once.

When the program is executed it will determine which network had network or characteristic changes to them and output rows that correspond to the changes.

A sample of the type of data to be found in the output would be:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Indicator** | **BRAMS\_ID** | **OBJECT** | **NAME** | **START** | **END** |
| I | 1234512345 | ROAD | ANN STREET | 0 | 300 |
| I | 1234512345 | SUBURB\_NAME | CBD | 0 | 200 |
| I | 1234512345 | SUBURB\_NAME | NEW FARM | 200 | 300 |
| I | 1234512345 | ASSET\_OWNER | BCC | 0 | 250 |
| I | 1234512345 | ASSET\_OWNER | MAINROADS | 250 | 300 |
| C | 5432154321 | ROAD | ROSE STREET | 0 | 300 |
| C | 5432154321 | SUBURB\_NAME | CBD | 0 | 200 |
| C | 5432154321 | SUBURB\_NAME | NEW FARM | 200 | 300 |
| C | 5432154321 | ASSET\_OWNER | BCC | 0 | 250 |
| C | 5432154321 | ASSET\_OWNER | MAINROADS | 250 | 300 |
| D | 9876543210 | ROAD | PETAL STREET |  |  |

## Implementation Details

The program needs to be able to determine if any tracked items have changed between two dates. Then return the BRAMS Corridor ID and all corresponding characteristics regardless of what has actually changed.

The following are the input parameters for the program:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter Name** | **Format** | **Type/Length** | **Mandatory** | **Comments** |
| Start Date | DATE | DD-MMM-YYYY | Y | Modified or Effective Date |
| End Date | DATE | DD-MMM-YYYY | Y | Modified or Effective Date |
| BRAMS ID | DATE | 10,0 | N | BRAMS Primary Corridor ID, This is a valid ID for a corridor listed in 3.1 |

The general logic of the program will be:

Compile a list of Corridor IDs that had a change occur to them during the inputted date range. Valid BRAMS changes are Insert (I), Updated (C), or End Dated (D). To make this list first the Corridor data is searched for Modified Dates and End Dates in our date range, those items are added directly to the list.

Next Characteristics that are of a group type are scanned for searched for Modified Dates and End Dates in our date range. Once, the records are identified they are translated to a Corridor ID and added to the list.

Next Characteristics that are of an asset type are scanned for searched for Modified Dates and End Dates in our date range. Once, the records are identified they are translated to a Corridor ID and added to the list.

Once the list of Changed Corridor IDs is found, the program will construct the output based on Unique IDs within that list. If during this construction process, the corridor is End Dated the Delete Output (D) type will be invoked and the Characteristics skipped. For the Change Output (C) and the Inserted Output (I) the program will continue to fill in the corresponding characteristics.

If the BRAMS ID parameter is supplied then the program will only list the information for that BRAMS ID and characteristics if a tracked item has changed. In the unlikely case that the date range includes the time when it was Inserted but nothing else has changed the Changed Output (C) data will be supplied and not the Inserted Output (I) data.

When data is outputted, there can be three different values in the indicator column. These indicators display what operation has happened during the date range.

* Inserted Output
  + If a new object/characteristic is added and effective during the date range and the optional BRAMS\_ID parameter was not used then the following data is filled in.
    - INDICATOR: I
    - BRAMS\_ID: The current BRAMS Corridor ID
    - OBJECT: Current record type, Corridor type/ characteristic type
    - NAME: This is the value of the characteristic that has changed
    - START: This is start point of the item.
    - END: This is end point of the item.
* Changed Output
  + If an object/characteristic is modified and effective during the date range and has not been end dated.
    - INDICATOR: C
    - BRAMS\_ID: The current BRAMS Corridor ID
    - OBJECT: Current record type, Corridor type/ characteristic type
    - NAME: This is the value of the characteristic that has changed
    - START: This is start point of the item.
    - END: This is end point of the item.
* Deleted Output
  + If a new object/characteristic is end dated during the date range. In this case only the Corridor Record is outputted since all other characteristics are automatically closed/end dated.
    - INDICATOR: D
    - BRAMS\_ID: The current BRAMS Corridor ID
    - OBJECT: Current record type, Corridor type
    - NAME: This is the name of the Corridor that has changed
    - START: null
    - END: null
* Look for date modified and end dates for corridors between the start and end dates
  + Add BRAMS corridor ID to list
* Look for date modified and end dates for characteristics between the start and end dates
  + If found get the BRAMS corridor ID and add to list
* Take a “distinct” look at the list to get a list of corridors
* Build the Corridor data and the characteristics “table”

## Process Flow

* Determine all the occurrences of an insert or end date of a Road(and Median)Verge/Kerb Corridor in NM\_ELEMENTS and create a list with asset ID and indicator (I or D) in it.
* Determine all the occurrences of an insert or end date of a Road(and Median)Verge/Kerb datum in NM\_ELEMENTS\_ALL. This implies a change to a corridor length. Determine the ID of the related corridor and add them to the list (unless they exist in the list already) with asset ID and indicator (always ‘C’ ) in it.
* Determine all the occurrences of an insert or end date of an object (inventory item or goup item) relating to a characteristic in NM\_MEMBERS\_ALL. This implies a change to a characteristic. NM\_MEMBERS\_ALL will identify the affected datum which can be used to determin the affected corridor. Determine the ID of the related corridor and add them to the list (unless they exist in the list already) with asset ID and indicator (always ‘C’ ) in it.
* If the BRAMS ID input parameter is null proceed to the next step. If not, remove all items from the list except the item listed in the BRAMS ID input parameter.
* Check if the list contains any items, if it does not, return null (i.e. no data has changed and no update is required).
* For all corridors in the list, that have an indicator of ‘C’ or ‘I’ (but not ‘D’ ) generate a full set of characteristic information. Initially all characteristics will have a indicator of ‘C’.
* Update the output set so that if a Road(and Median)Verge/Kerb object is listed with an indicator of ‘I’, update all other rows in the output, with the date ID to also have an indicator of ‘I’
* Return the final data set to the WebServer for delivery.

## Error Trapping

Currently the types of anticipated error trapping include:

1. START date is less than END Date: The system will check that START Date should be greater than the END Date
2. BRAMS ID does not exist.
3. Catch-all: A general error trap message will also be communicated. Where possible it will include standard Oracle error messages, which will help for debugging.
4. To make this data available to the WebService
5. <<<<<<<<<<<<<<<<Fill in>>>>>>>>>>>>>>>>>>>
6. <<<<<<<<<<<<<<<<Fill in>>>>>>>>>>>>>>>>>>>

# Data Output

The web service will take the data that’s been created . . . .

# Documentation Requirements

# Assumptions

# Conclusion

This document is the result of a series of conversations between Bentley Systems, Brisbane City Council with the objective of establishing an interface between BaSE SAP and the BRAMS Exor used to manage the road network and key asset data. From these discussions, Bentley Systems has created a software design that meets the agreed scope of this project and the requirements that need to be met in order for the project to be successful.

Using this design, Bentley Systems will create an estimate for the development and deployment of the software that details how the interface software will meet the requirements and an estimate of effort required to complete the project.