LIFE+10 ENV/IT/000389

INTEGREEN

Action 3: System design

D.3.1.1

Data management unit and environmental stations front-end design

Annex 0: INTEGREEN FRAME diagrams

Project Coordinating Beneficiary	Municipality of Bolzano
Project Associated Beneficiary n.2	TIS innovation park (TIS)
Project Associated Beneficiary n.3	Austrian Institute of Technology (AIT)
Project Associated Beneficiary n.4	Österreichisches Forschungs- und Prüfzentral Arsenal (ÖFPZ)

Document history

Date	Document Author(s)	Document Contribution
31/03/2014	Roberto Cavaliere, Paolo Valleri, Stefano Seppi (TIS), Reinhard Kloibhofer, Wolfgang Ponweiser (AIT)	Document finalization

Dissemination level: CO [1]
Delivery month: M31
Status: submitted to EC

[1] **PU** = Public; **CO** = Confidential (for members of the consortium only, including the European Commission); **RE** = Restricted, i.e. only a selected target of stakeholders defined by project consortium and validated by European Commission can access to the document. Environmental studies reported in Chapter 3 can have a different dissemination level, i.e. at least RE.

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Introduction

This aim of this annex is to synthetically present the personalized outputs of the FRAME design process. A high-resolution version of all Data Flow Diagrams are given in annex to this Report.

2 INTEGREEN FRAME Diagrams

In the top level Data Flow Diagram (DFD) of FRAME it is possible to check the four functional areas covered by the INTEGREEN architecture, as well as the high-layer data flows chosen for interconnecting them together as well with the users of this architecture. The most relevant data flows are those connecting functional area 3 (Manage Traffic) and 5 (Provide Support for Host Vehicle Services), which bi-directional communication exchange of data and on-board information processed centrally. The connection with functional area 6 (Provide Traveler Journey Assistance) guarantees the delivery of relevant real-time travel and traffic information to end-users. The architecture includes only partially functional area 2 (Provide Safety and Emergency Facilities) since the monitoring activities covered by INTEGREEN could be a very valuable input for organizations responsible for e.g. incidents management. The relevant data flow is 3.2.8 ("*send incident details to others*").

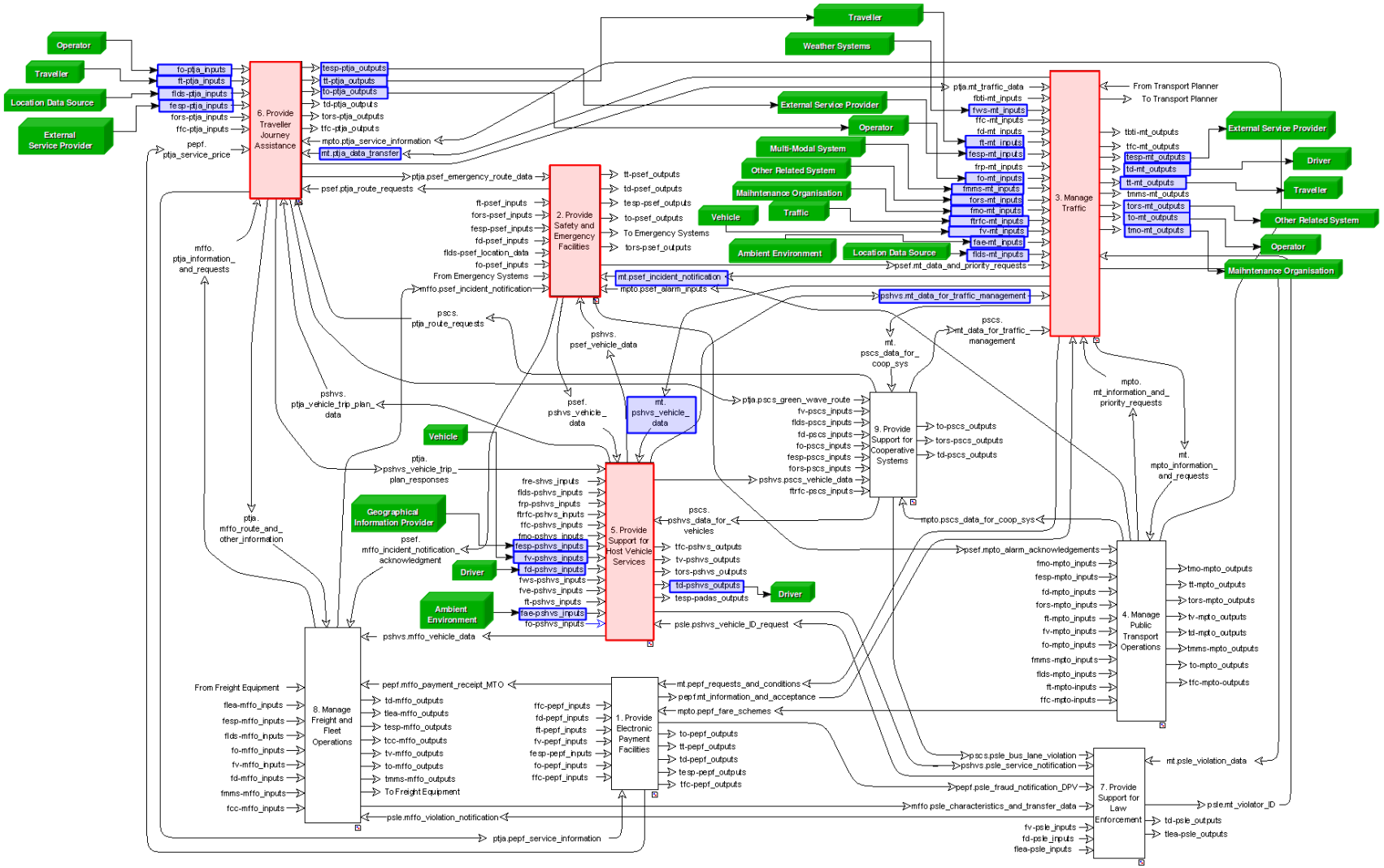

Figure 1: INTEGREEN Data Flows Diagram 0 – high-level design.

2.1 Area 2 – Provide Safety and Emergency Facilities

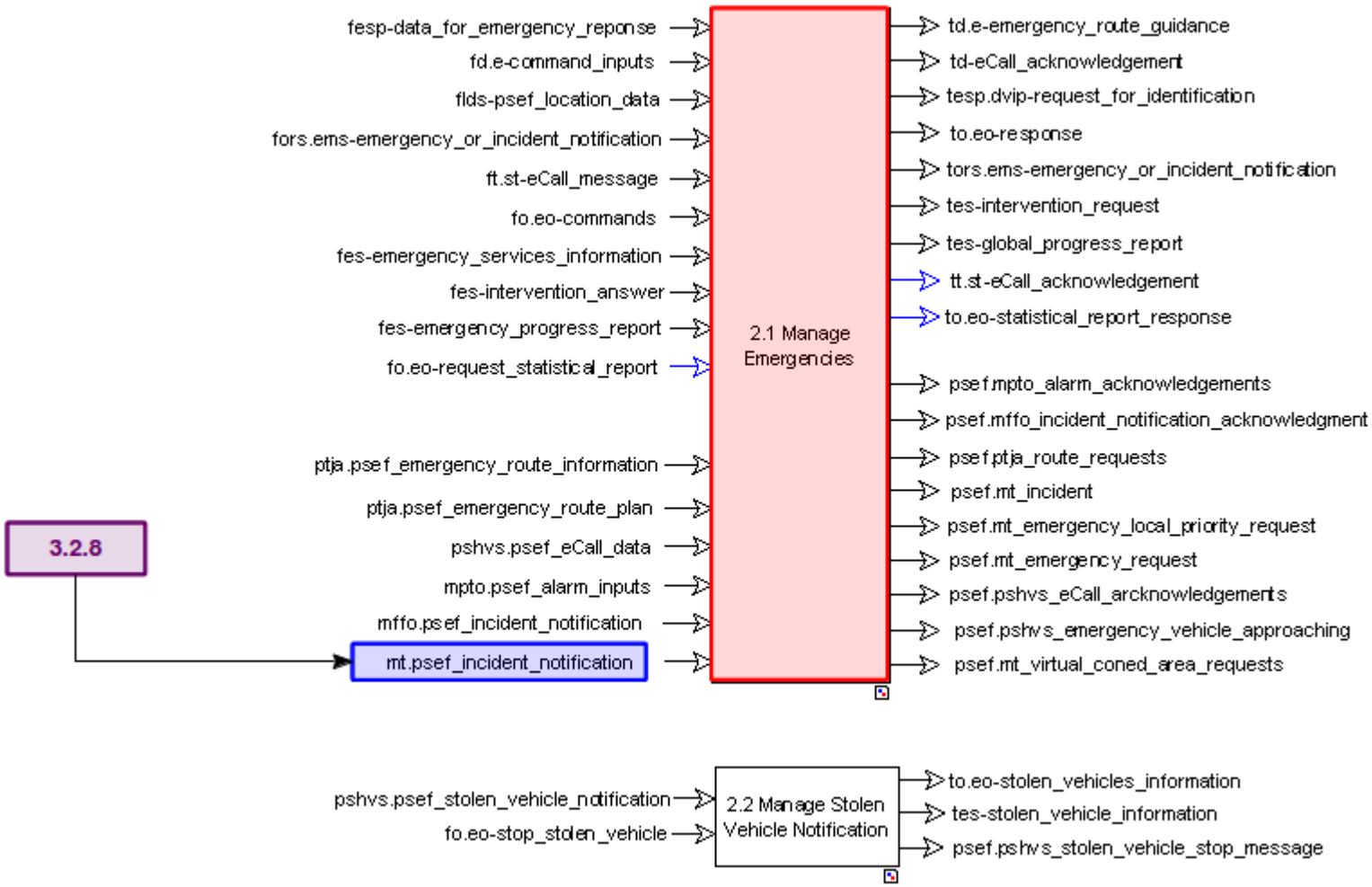

Figure 2: INTEGREEN Data Flows Diagram 2 – safety and emergency facilities management.

2.1.1 Sub-Area 2.1 Manage Emergencies

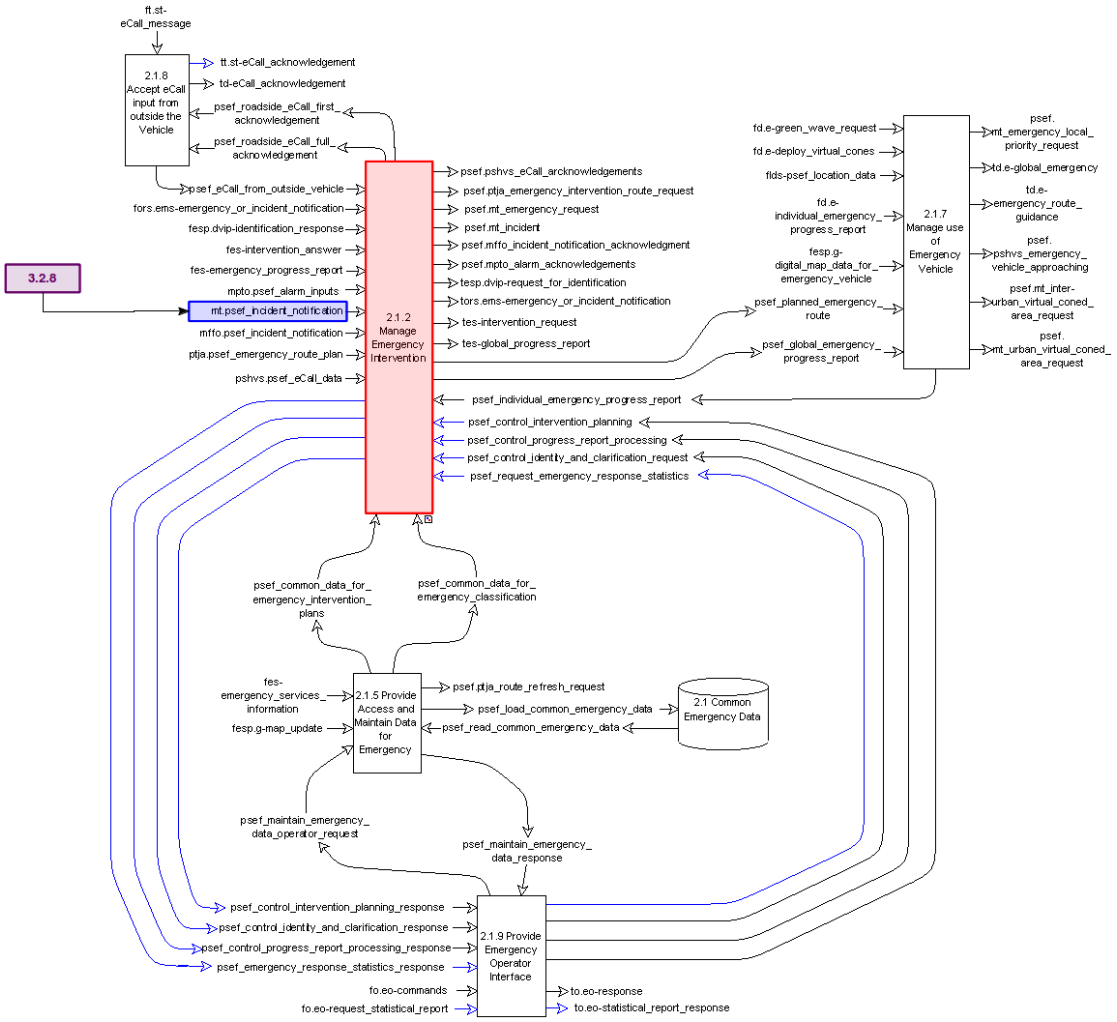

Figure 3: INTEGREEN Data Flows Diagram 2.1 – manage energy interventions.

2.2 Area 3 – Manage Traffic

Area 3 is one the key areas of INTEGREEN FRAME architecture. All sub-areas are included in the architecture; in particular, the most interesting area for INTEGREEN is 3.4 “Provide Environmental Information”, which is specifically thought for integrated traffic / air pollution assessments. Function 3.2 is the connection point with Area 2.

2.2.1 Sub-Area 3.1 Provide Traffic Control

In the traffic control sub-area, all functions are included, e.g. both urban and inter-urban traffic management, car parks and service areas management and moreover traffic predictions, since these are going to be soon included in the overall system, starting for parking forecasts.

This sub-area contains a lot of functions, as illustrated in the following DFDs. The connection point with Area 5 is covered by function 3.1.1.8 “Collect Urban Data from Vehicles”

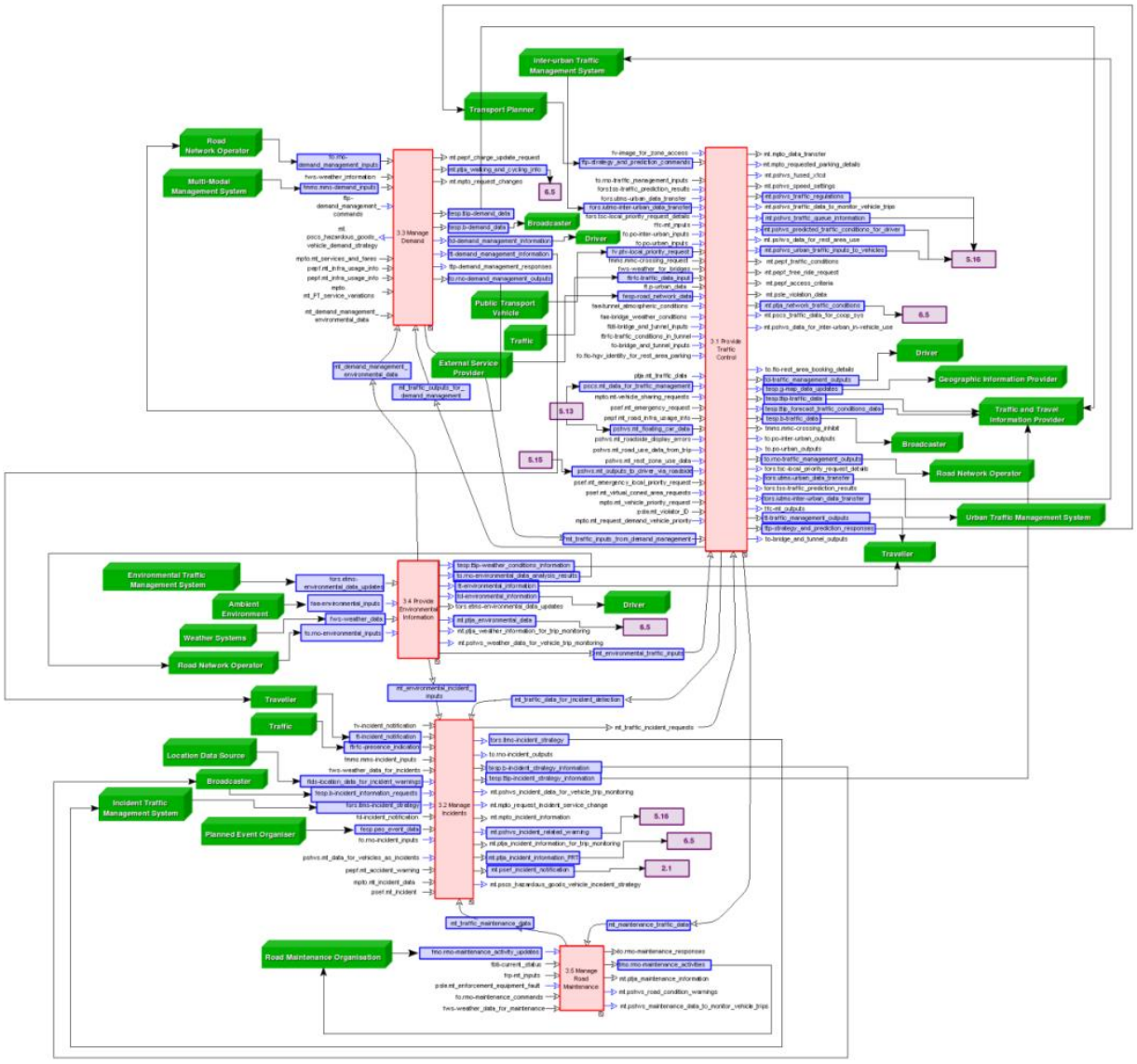

Figure 4: INTEGREEN Data Flows
Diagram 3 – manage traffic.

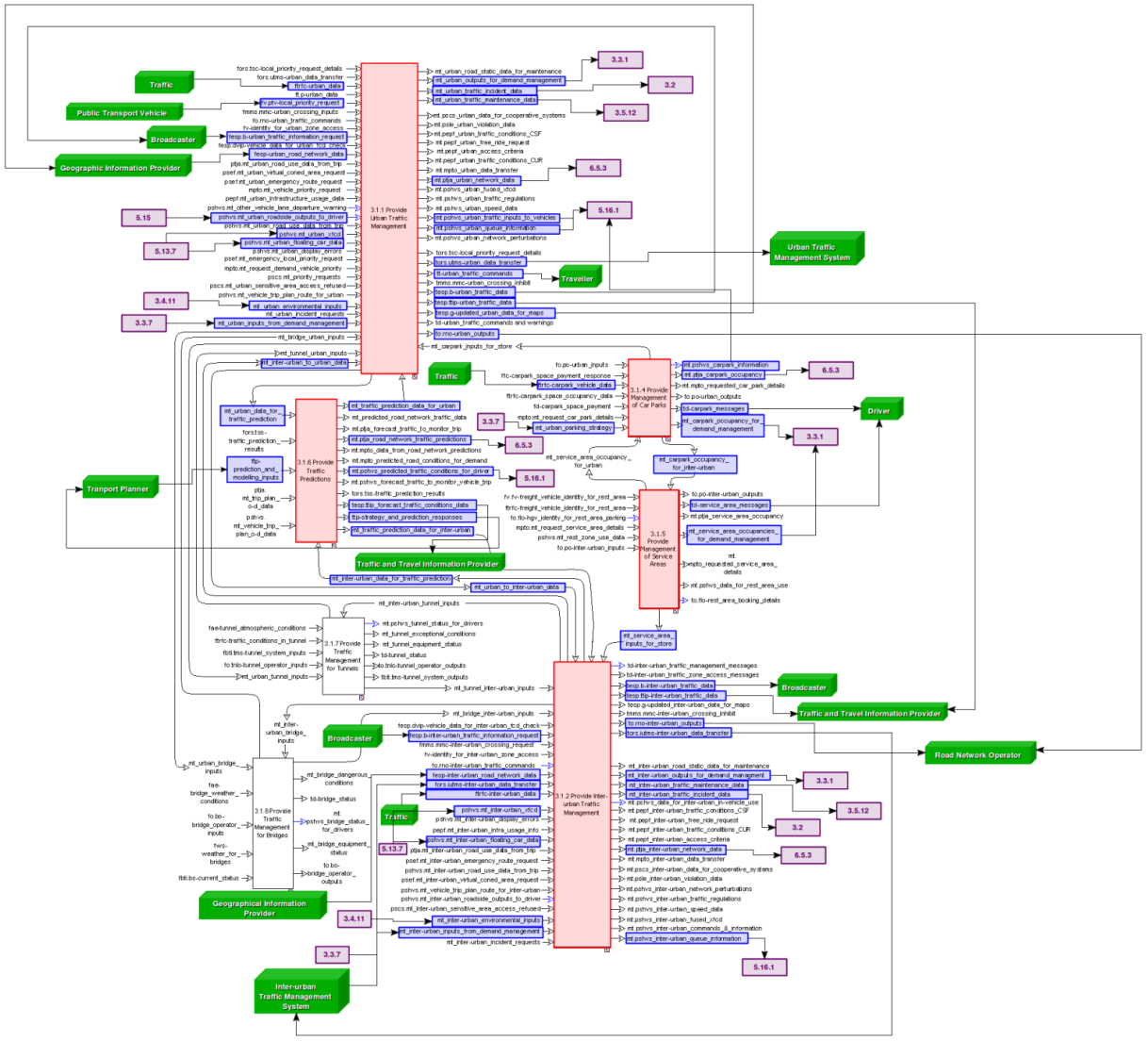

Figure 5: INTEGREEN Data Flows Diagram 3.1 – provide traffic control.

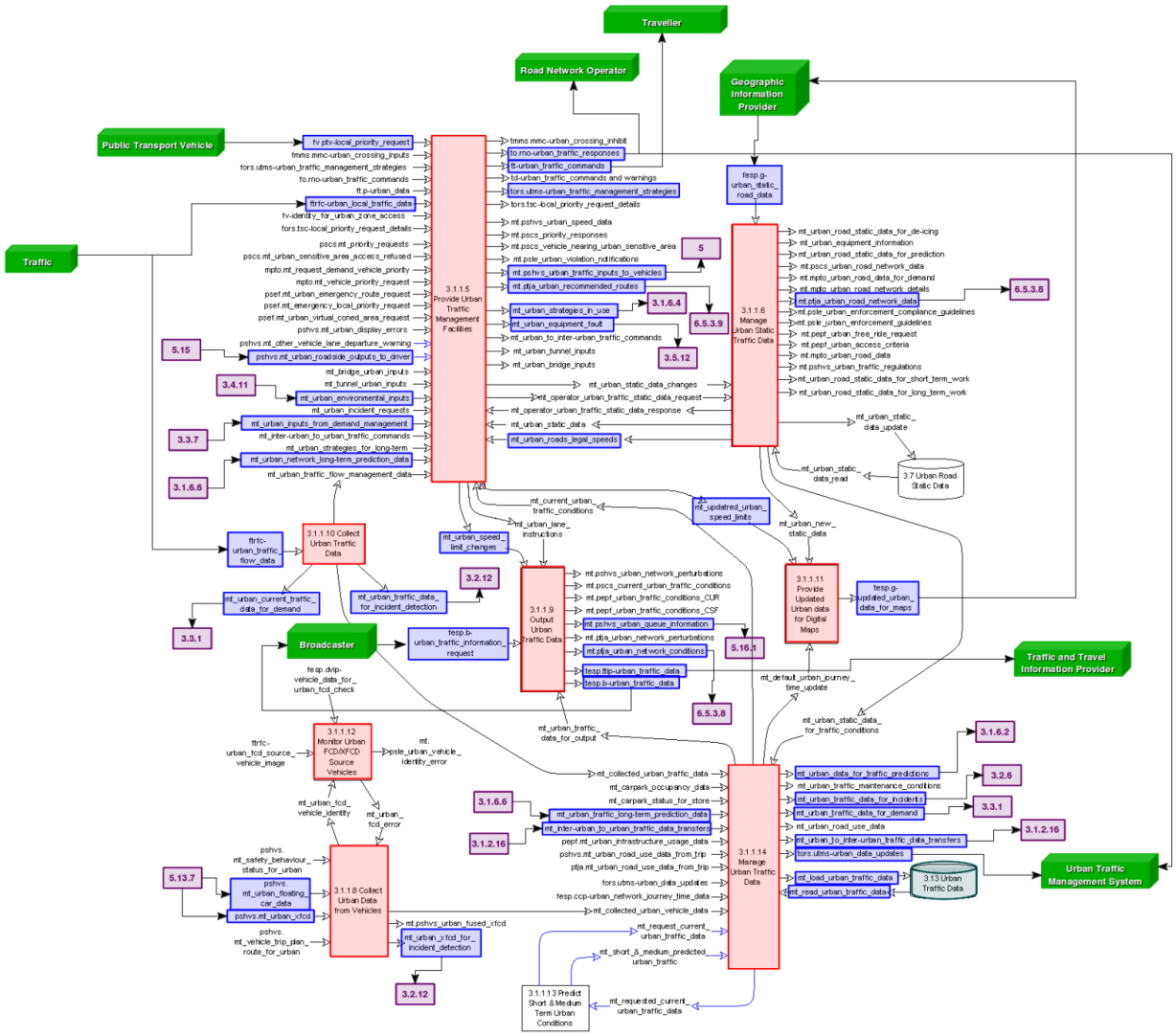

Figure 6: INTEGREEN Data Flows Diagram 3.1.1 – provide urban traffic management.

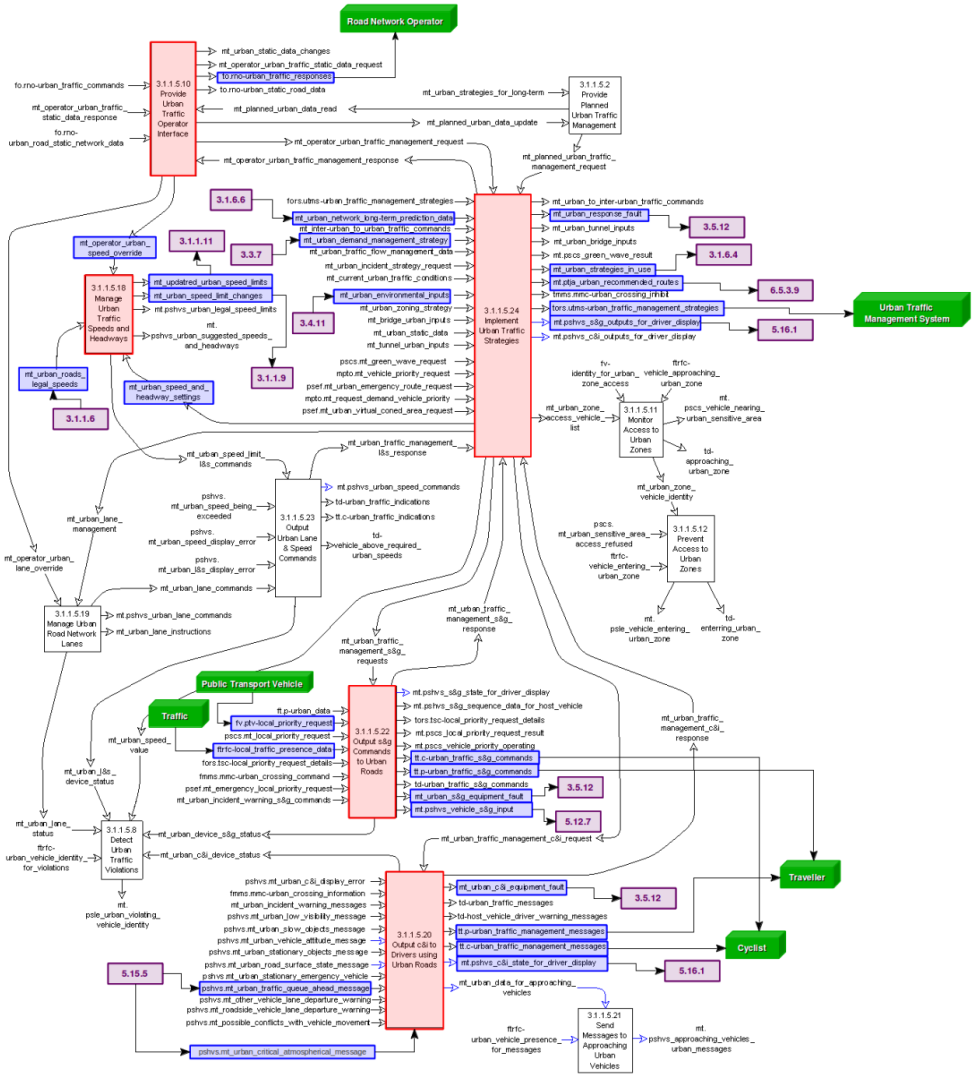

Figure 7: INTEGREEN Data Flows Diagram 3.1.1.5 – provide urban traffic management facilities.

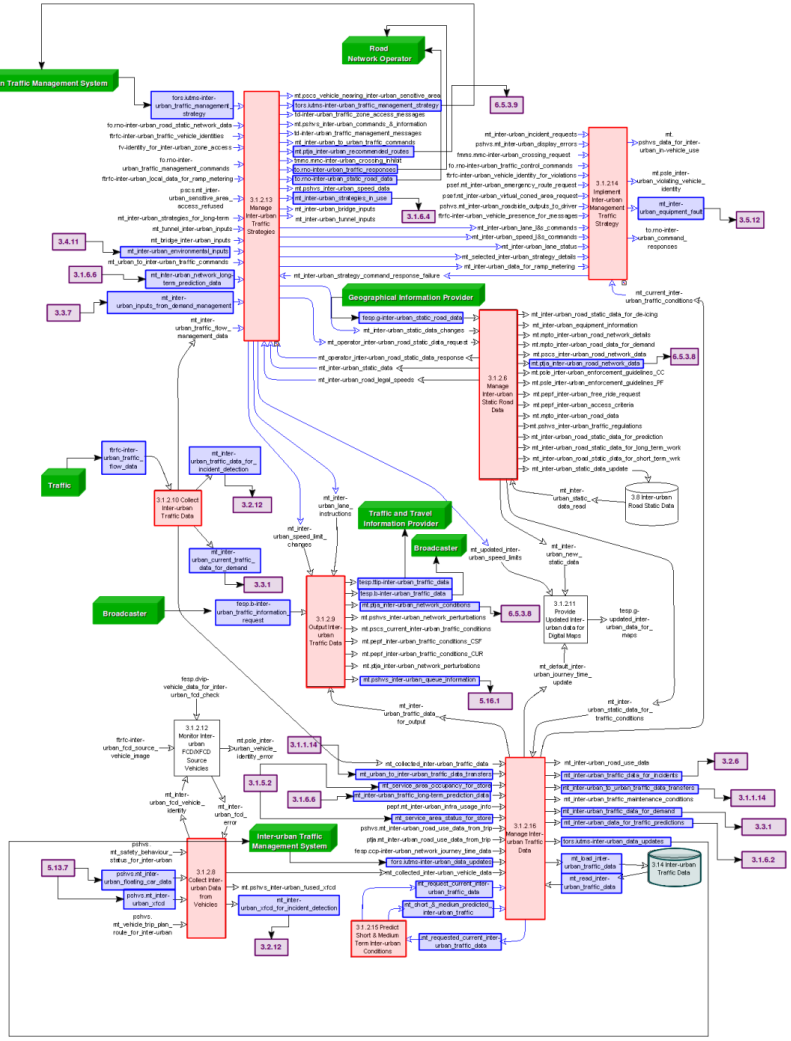

Figure 8: INTEGREEN Data Flows Diagram 3.1.2 – provide inter-urban traffic management.

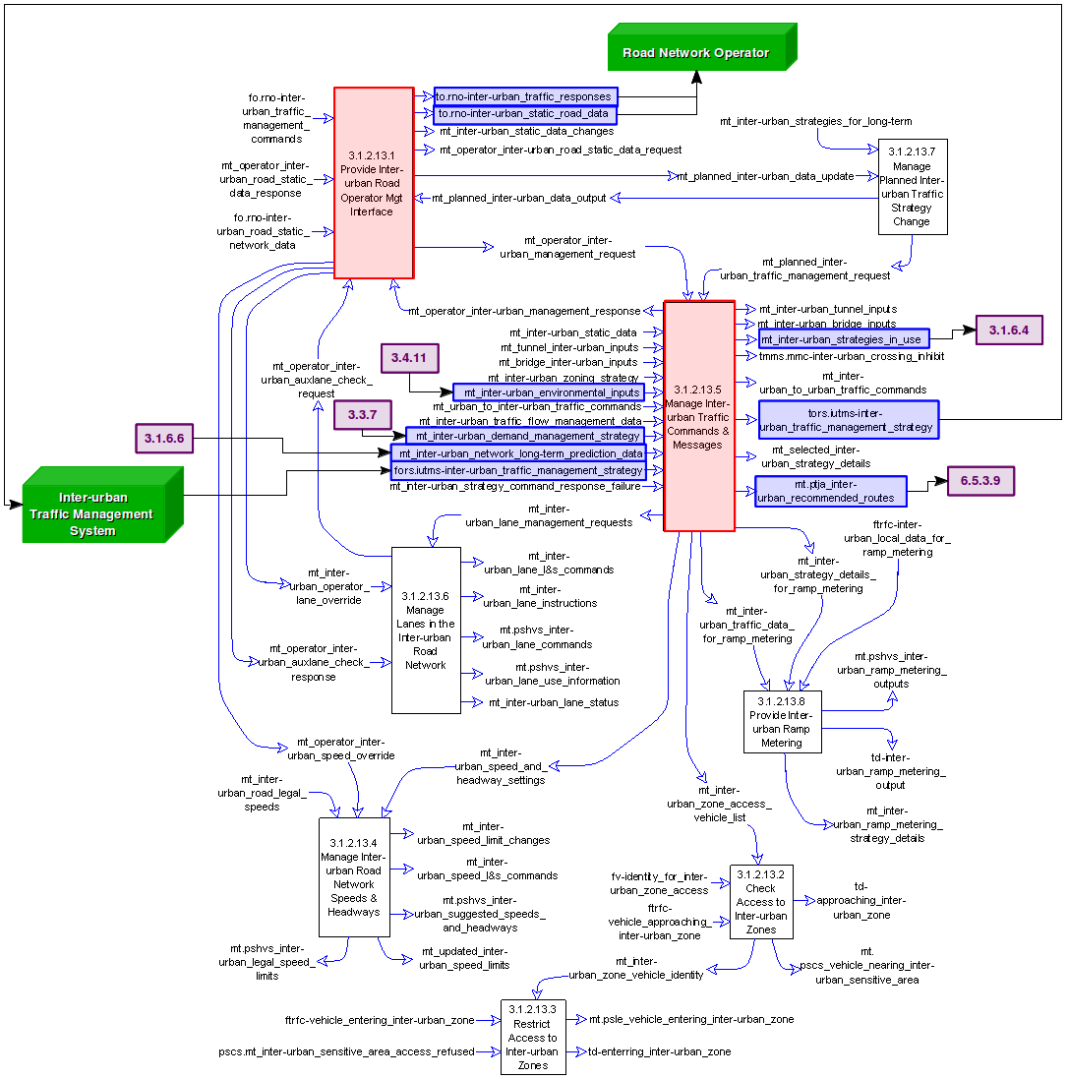

Figure 9: INTEGREEN Data Flows Diagram 3.1.2.13 – manage Inter-urban Traffic Strategies.

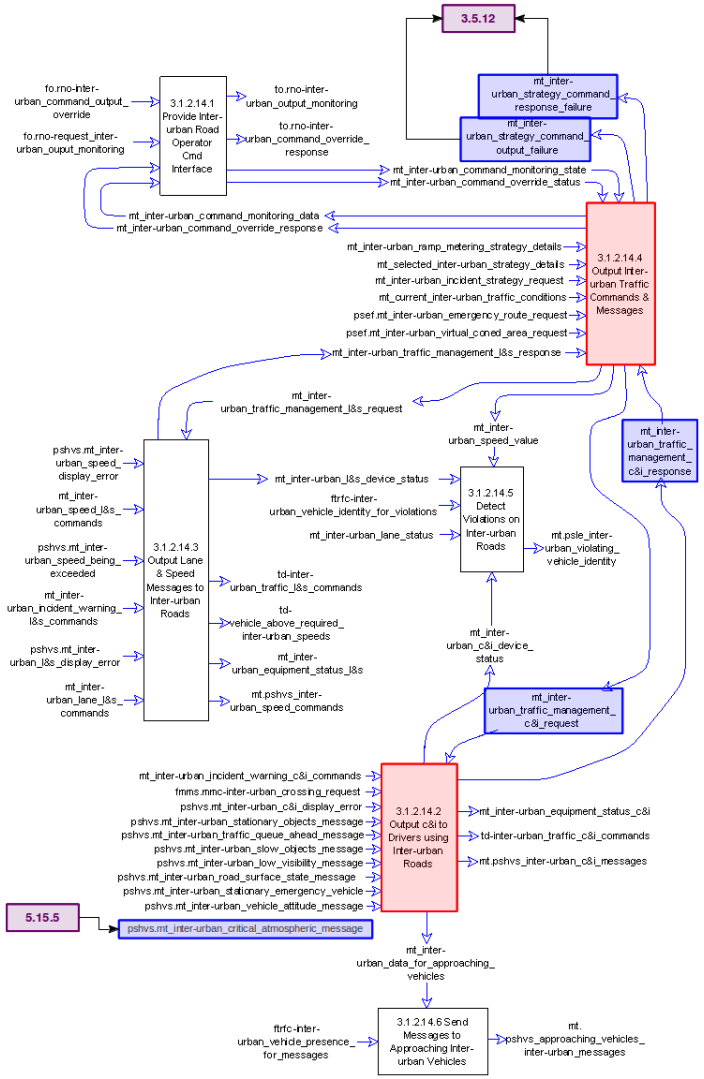

Figure 10: INTEGREEN Data Flows Diagram 3.1.2.14 – Implement Inter-urban Traffic Strategies.

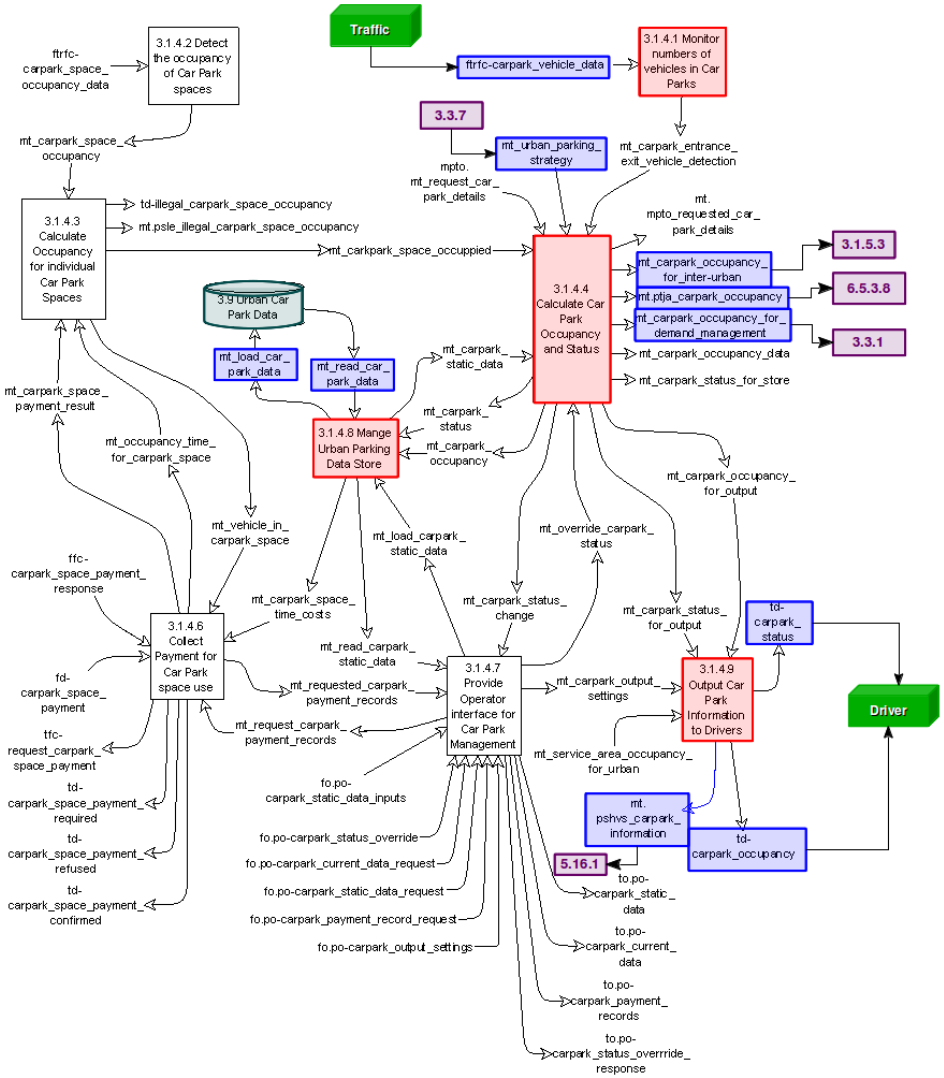

Figure 11: INTEGREEN Data Flows Diagram 3.1.2.4 – Provide Management of Car Parks.

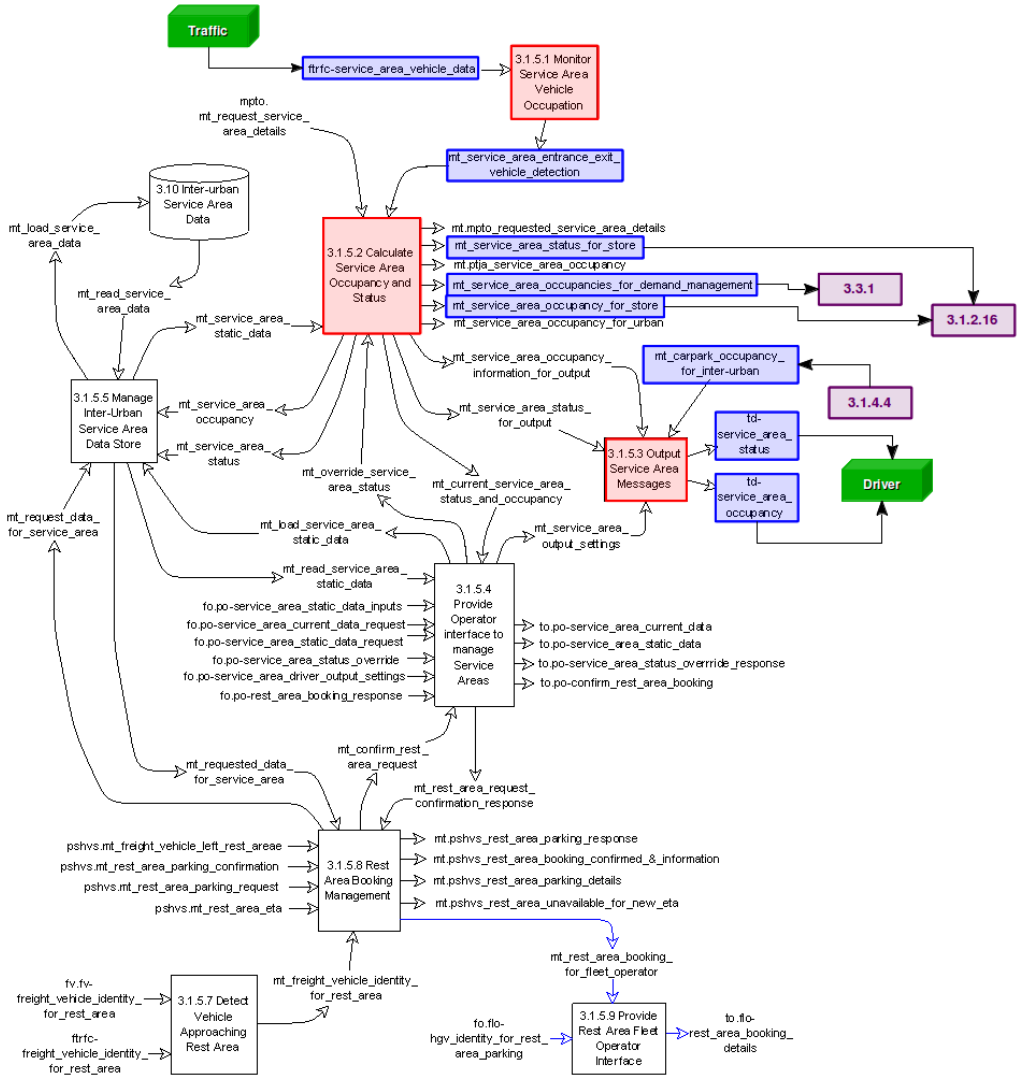

Figure 12: INTEGREEN Data Flows Diagram 3.1.2.5 – Provide Management of Service Areas.

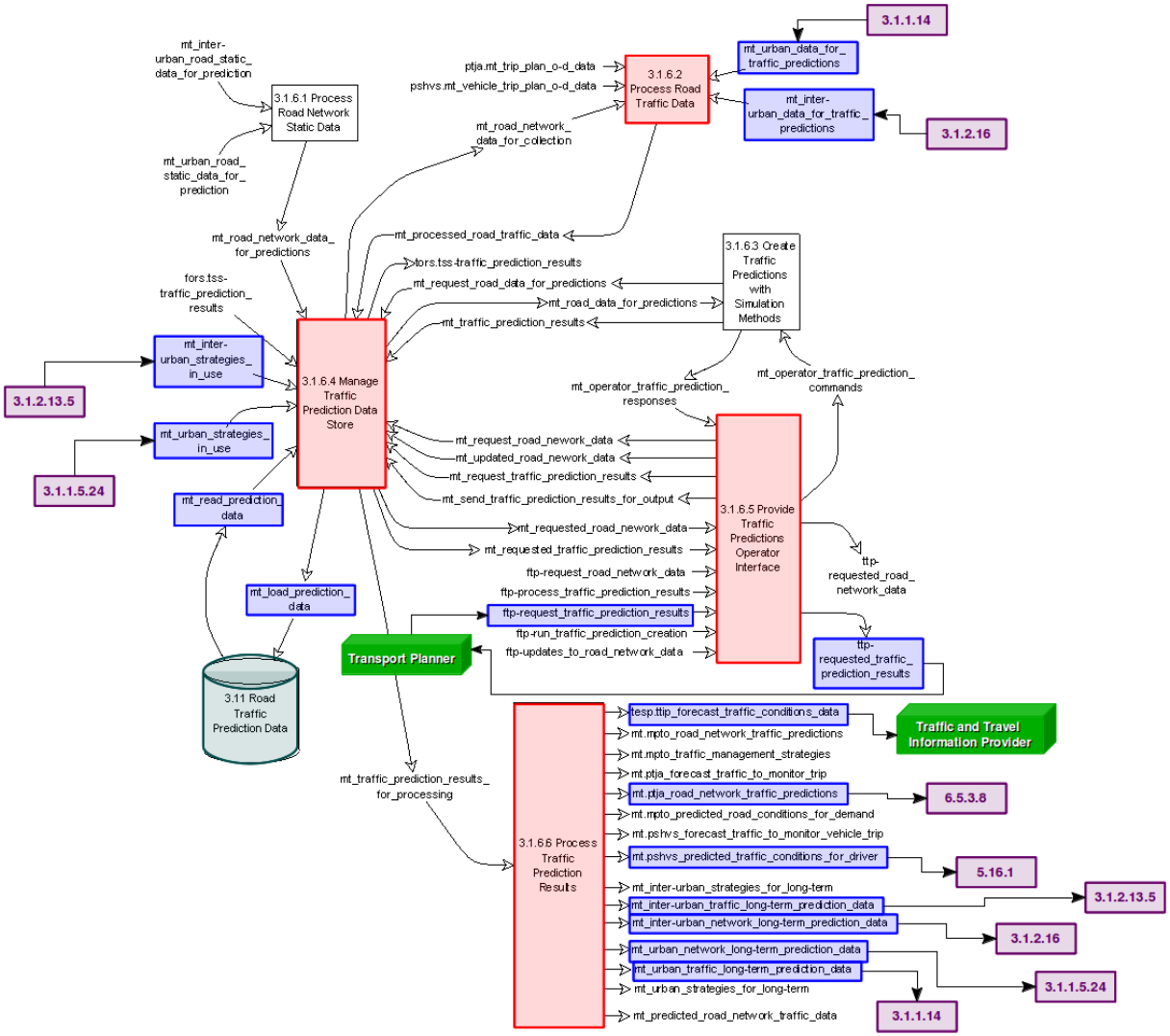

Figure 13: INTEGREEN Data Flows Diagram 3.1.2.6– Provide Traffic Predictions.

2.2.2 Sub-Area 3.2 Manage Incidents

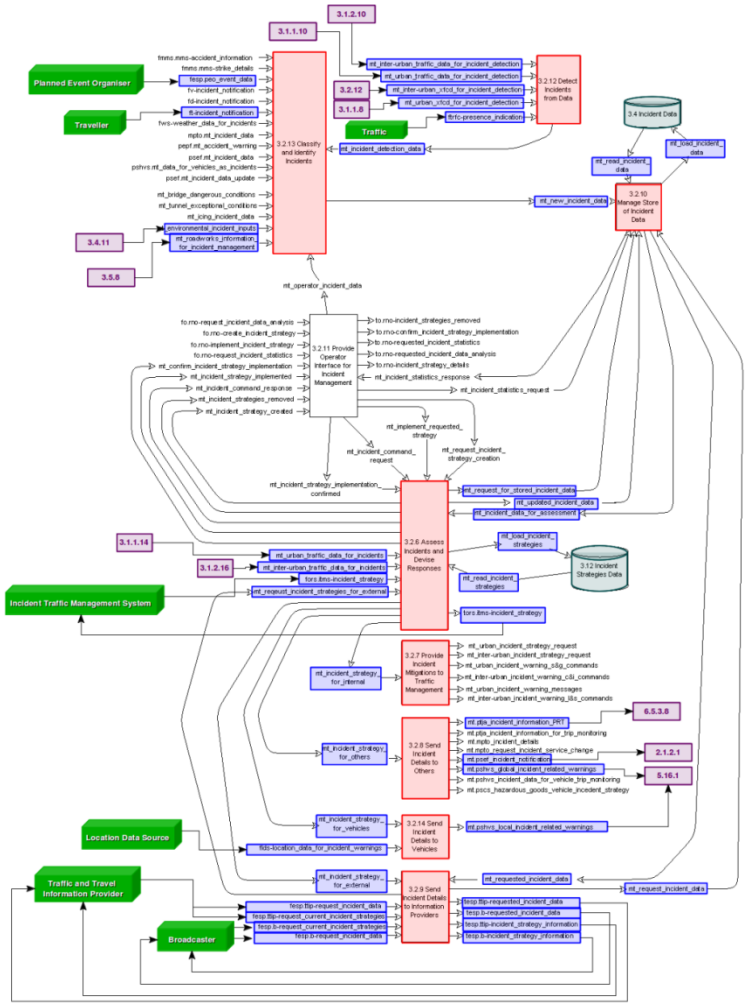

Figure 14: INTEGREEN Data Flows Diagram 3.2– Manage Incidents.

2.2.3 Sub-Area 3.3 Manage Demand

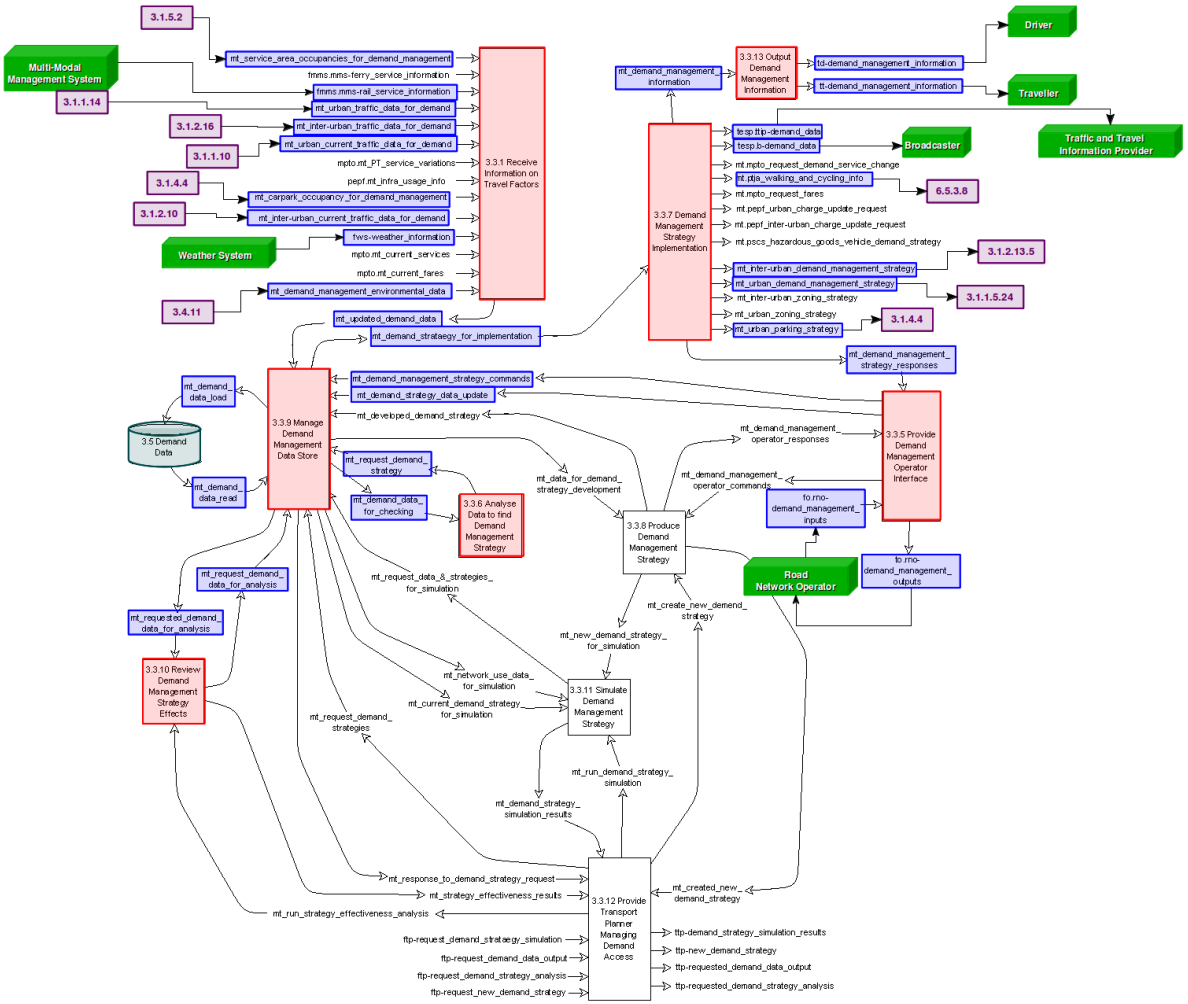

Figure 15: INTEGREEN Data Flows Diagram 3.3– Manage Demand.

2.2.4 Sub-Area 3.4 Provide Environmental Information

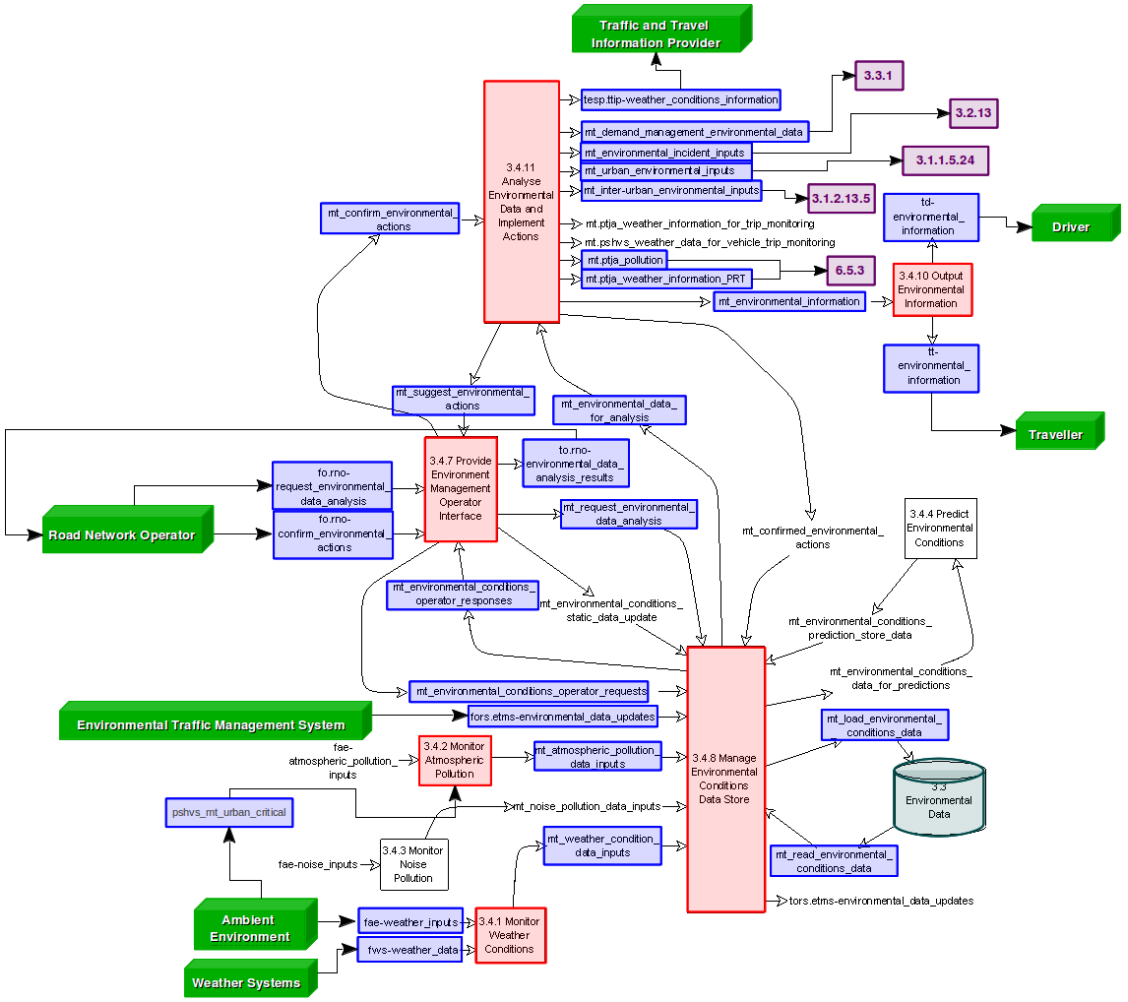

Figure 16: INTEGREEN Data Flows Diagram 3.4– Provide Environmental Information.

2.2.5 Sub-Area 3.5 Manage Road Maintenance

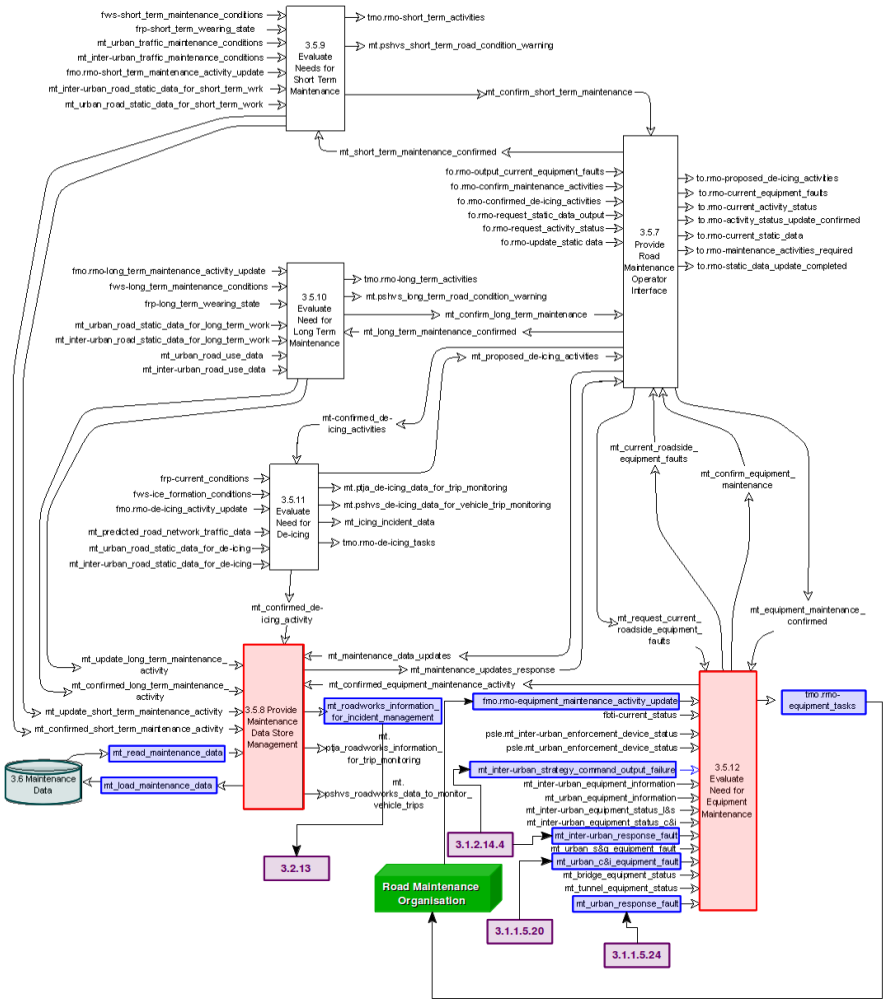

Figure 17: INTEGREEN Data Flows Diagram 3.5– Manage Road Maintenance.

2.3 Area 5 – Provide Support for Host Vehicle Services

This area covers all the functions that are expected to be covered by the mobile systems of INTEGREEN. The most relevant function is 5.15 "*provide in-vehicle detection and analysis*", which has the capability to monitor local vehicle conditions.

Other covered functions are:

- 5.12 "provide vehicle communications interfaces";
- 5.13 "provide vehicle data and ISA";
- 5.16 "provide outputs to host vehicle drivers".

This is the most interesting area of FRAME, since together with the functions available in area 9 it is possible to let the system evolve to a fully cooperative system based on V2X communications.

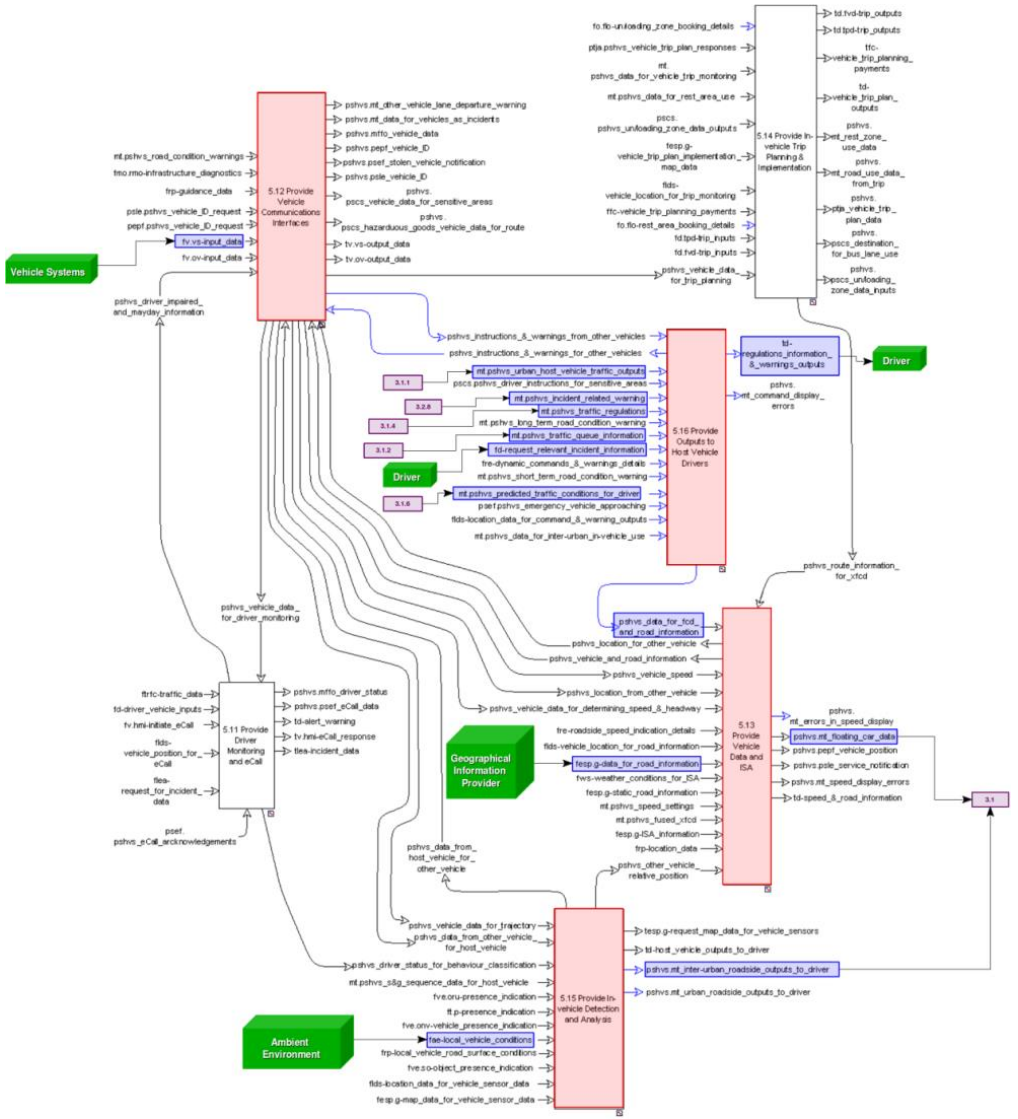

Figure 18: INTEGREEN Data Flows Diagram 5 – Provide Support for Host Vehicle Services.

2.3.1 Sub-Area 5.12 Provide Vehicle Communications Interfaces

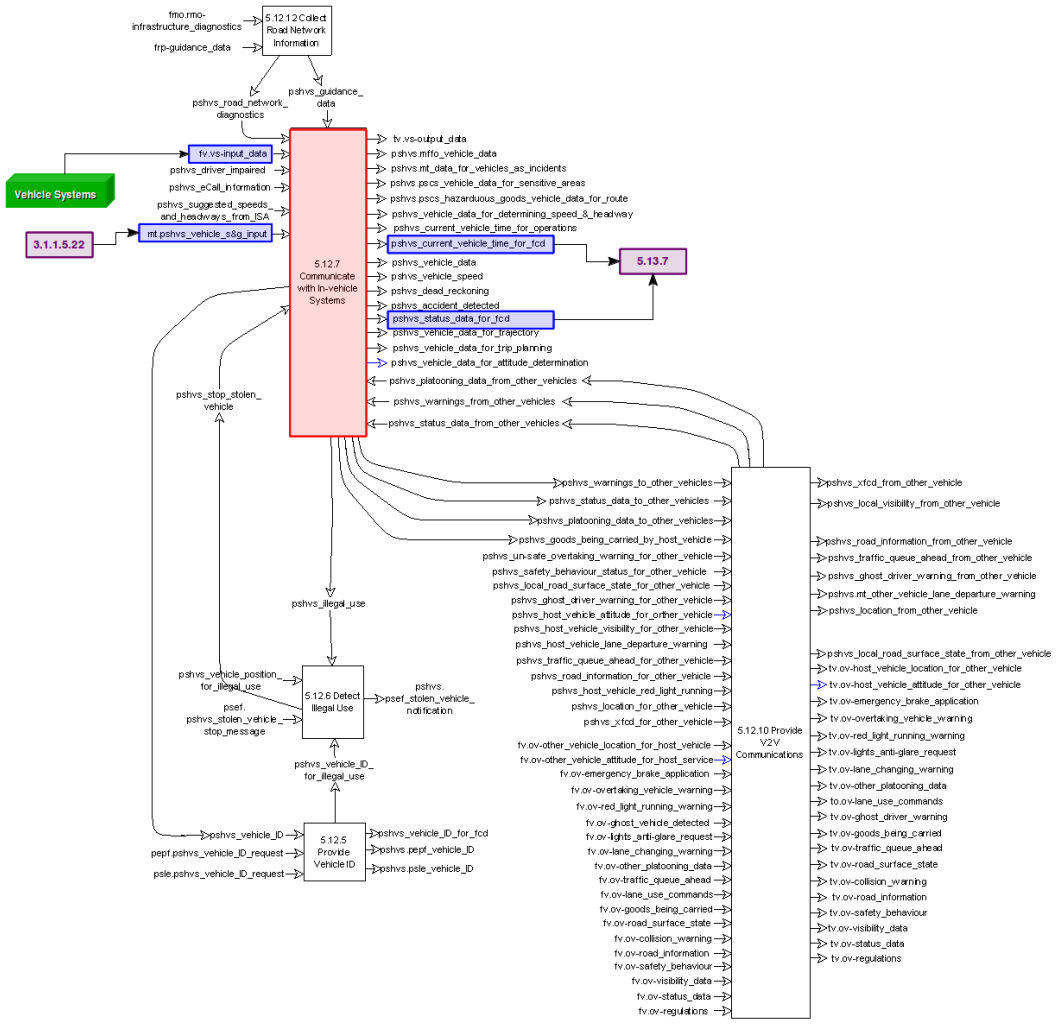

Figure 19: INTEGREEN Data Flows Diagram 5.12– Provide Vehicle Communications Interfaces.

2.3.2 Sub-Area 5.13 Provide Vehicle Data and ISA

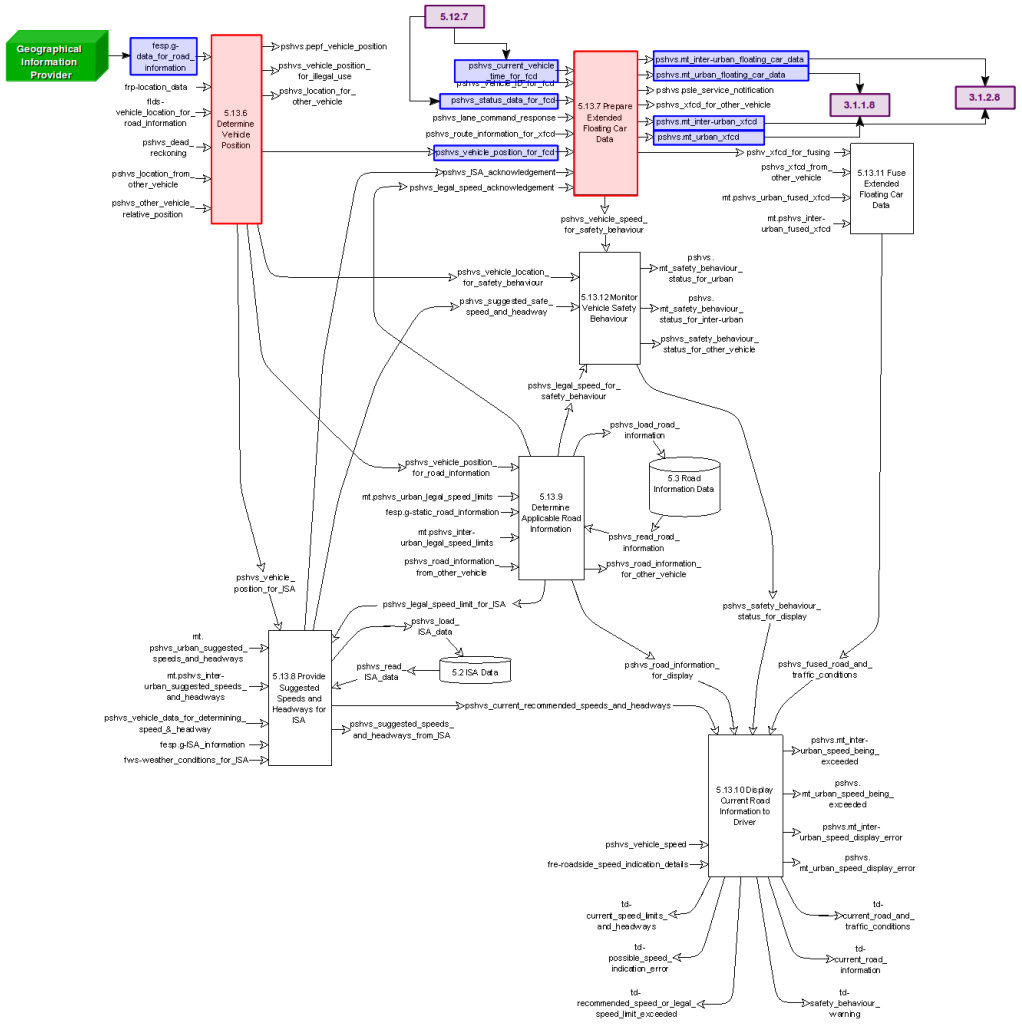

Figure 20: INTEGREEN Data Flows Diagram 5.13– Provide Vehicle Data and ISA.

2.3.3 Sub-Area 5.15 Provide In-vehicle Detection and Analysis

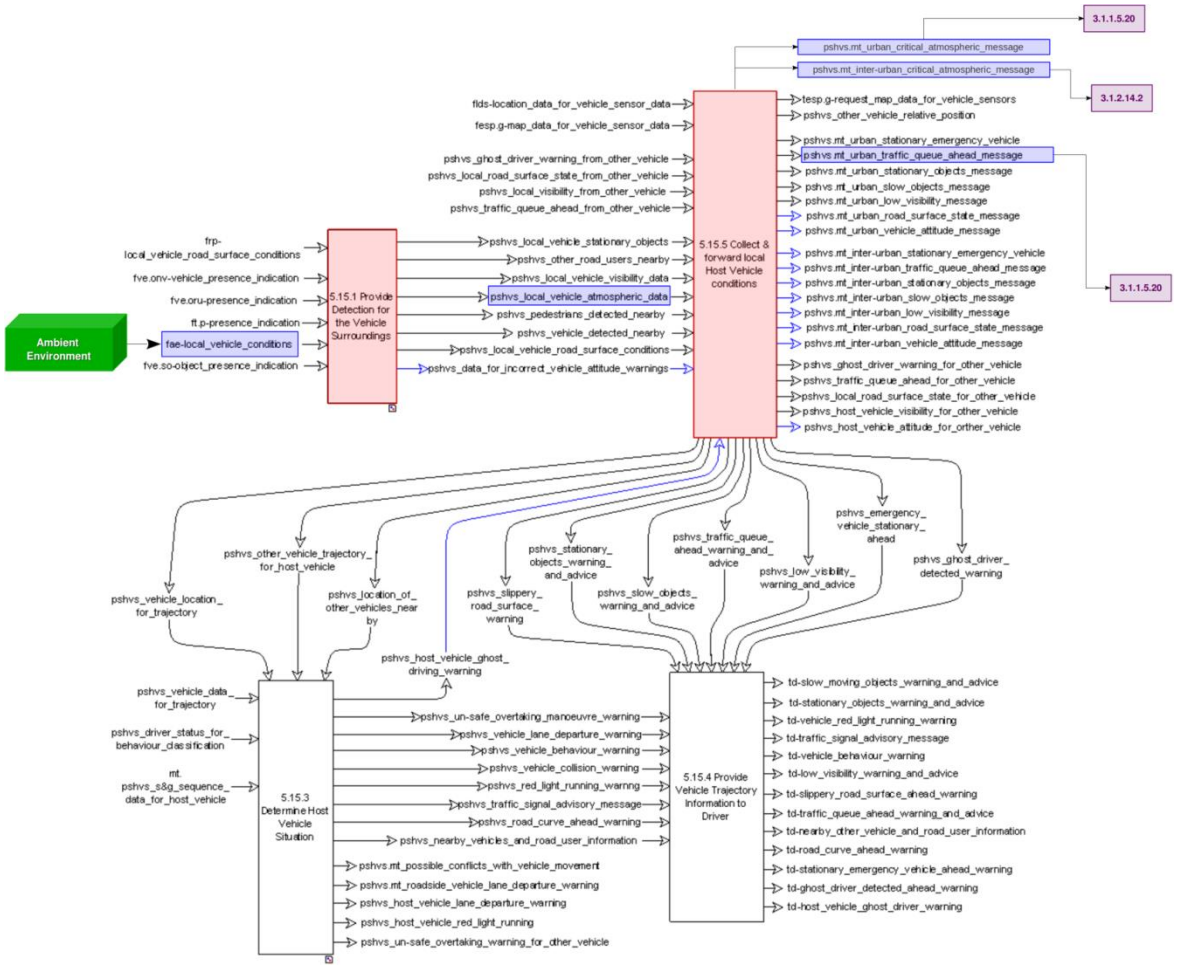

Figure 21: INTEGREEN Data Flows Diagram 5.15– Provide In-vehicle Detection and Analysis.

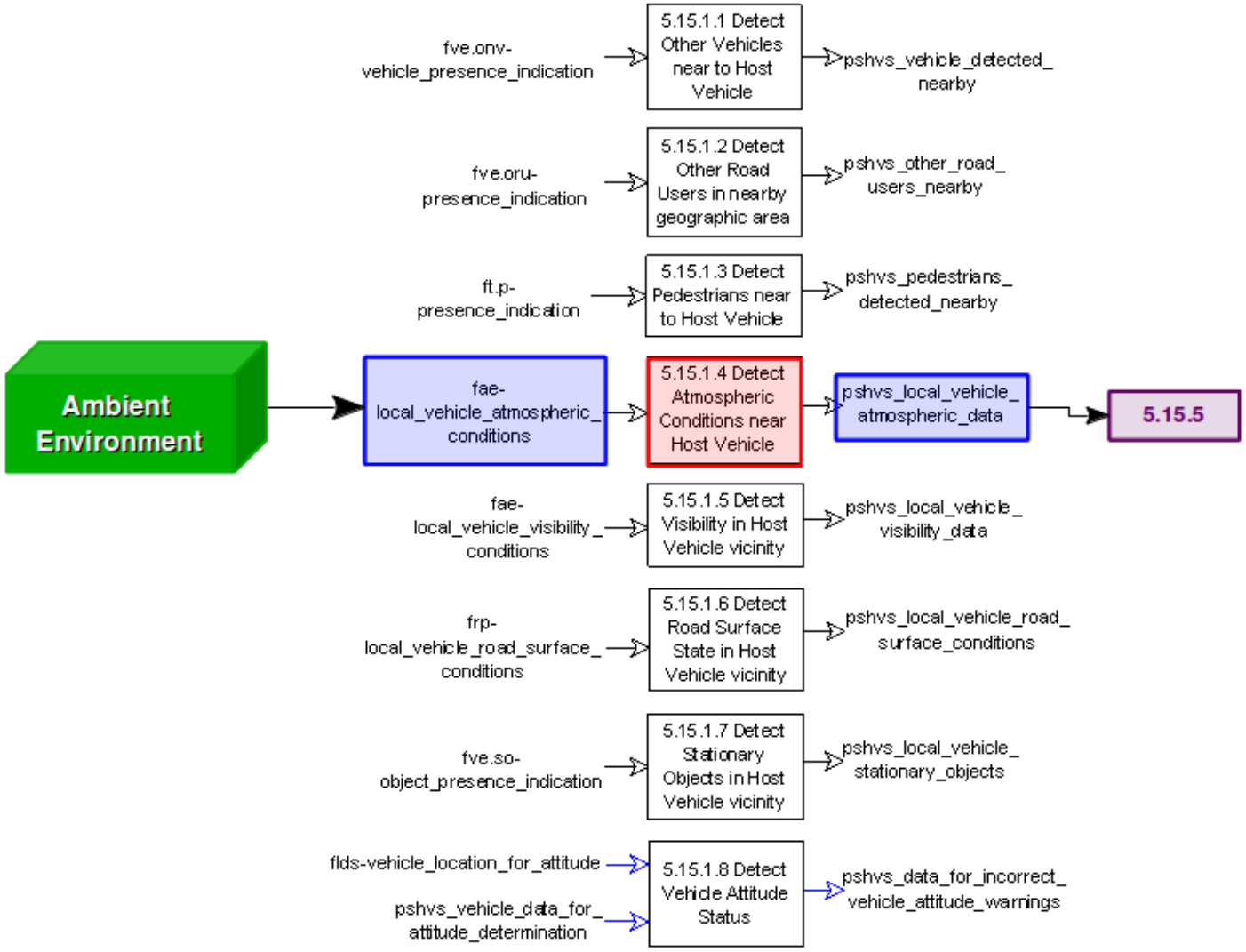

Figure 22: INTEGREEN Data Flows Diagram 5.15.1– Provide Detection for the Vehicle Surroundings.

2.3.4 Sub-Area 5.16 Provide Outputs to Host Vehicle Drivers

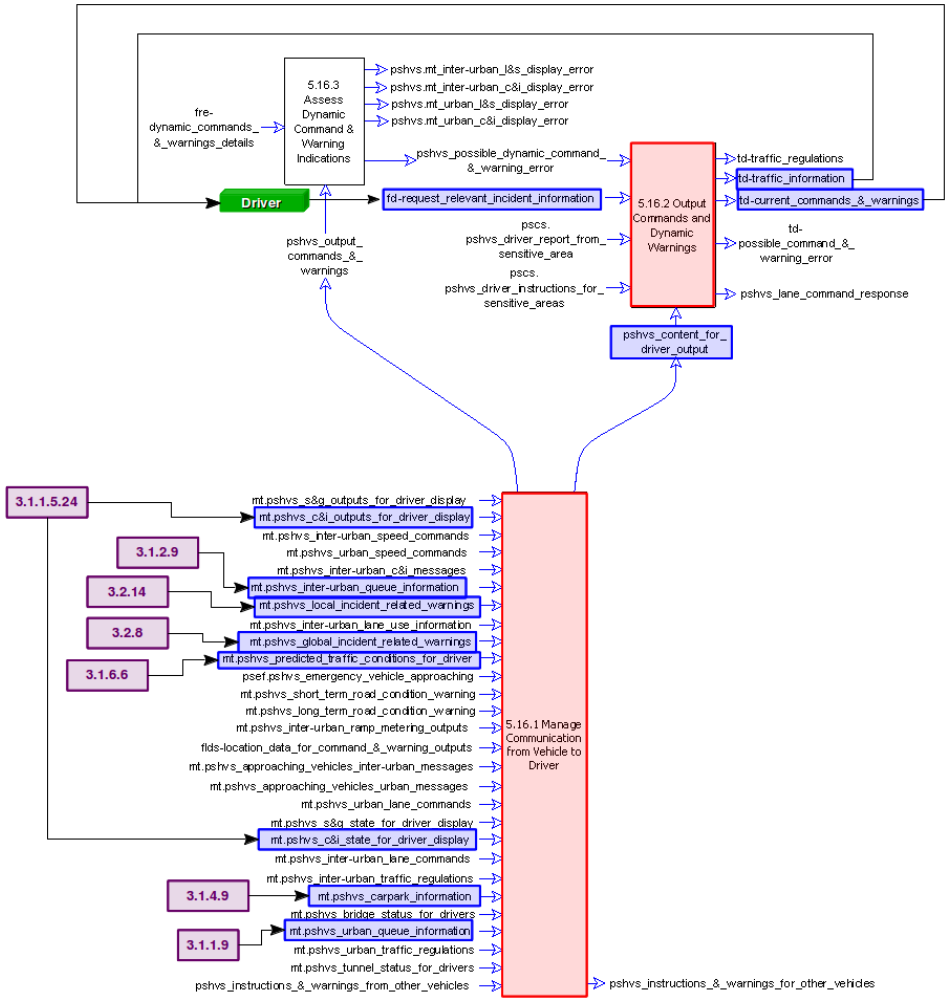

Figure 23: INTEGREEN Data Flows Diagram 5.16– Provide Outputs to Host Vehicle Drivers.

2.4 Area 6 – Provide Traveler Journey Assistance

This area covers all the functions that are related to journey planning by end-users. All main functions are covered, namely:

- 6.3 “support trip”;
- 6.5 “prepare trip plan”;
- 6.6 “provide traveler information”;
- 6.7 “manage general trip preferences”.

The connection with area 3 (which provide real-time traffic information) is covered by function 6.5. It is worth noting how FRAME natively supports the idea of traveller information service providers based on the data made available from the TCCs.

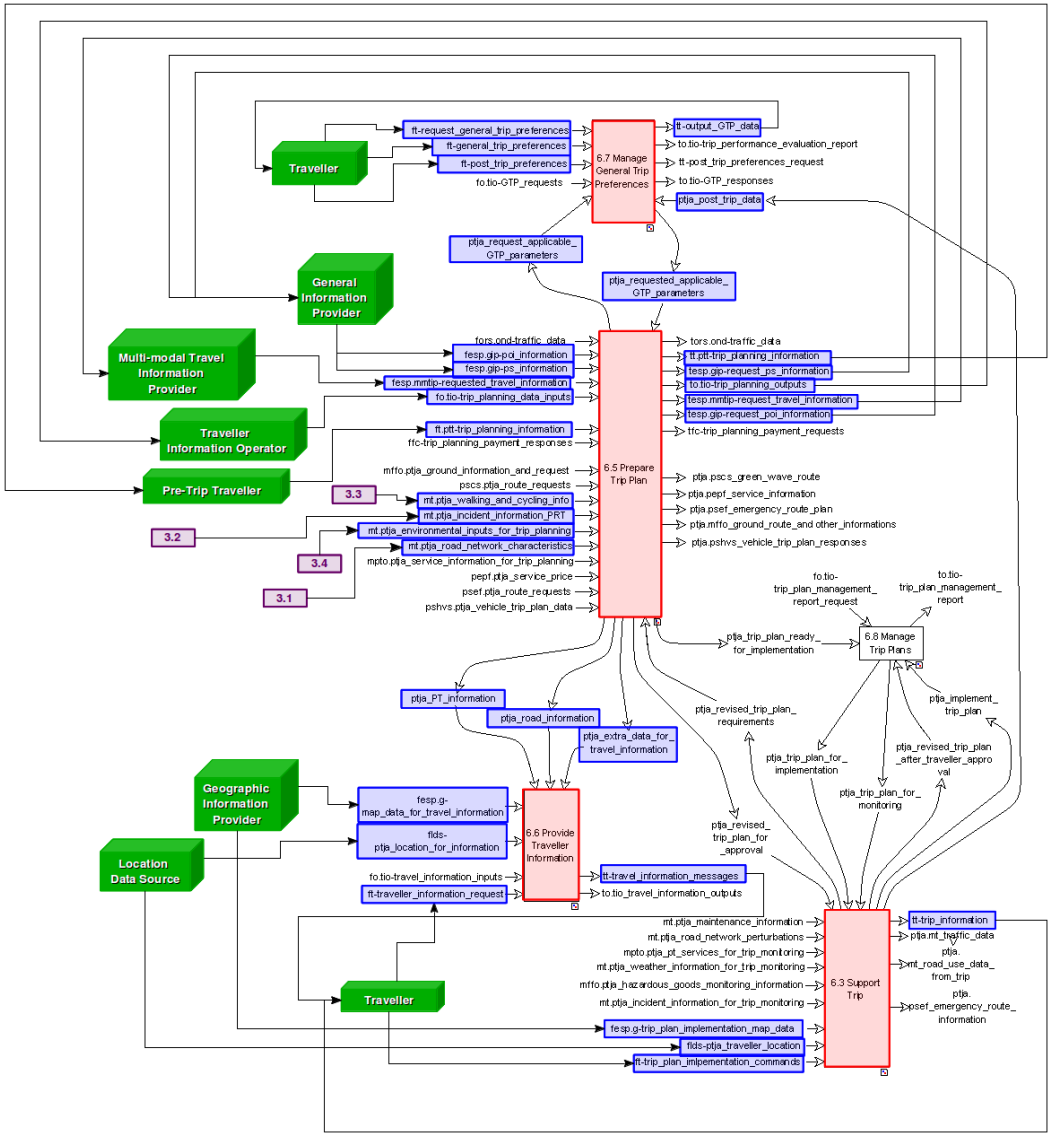

Figure 24: INTEGREEN Data Flows Diagram 6 – Provide Traveler Journey Assistance.

2.4.1 Sub-Area 6.3 Support Trip

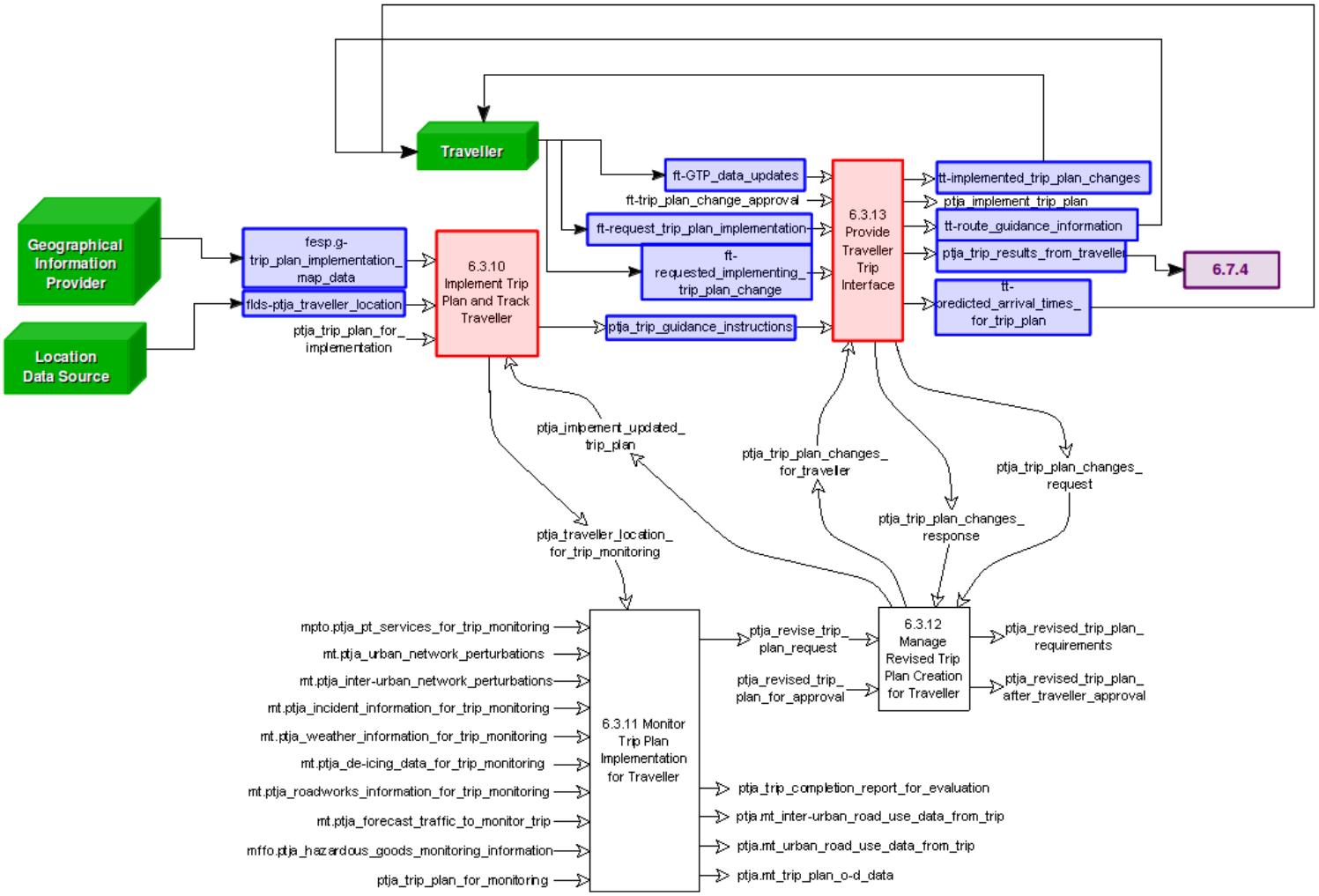

Figure 25: INTEGREEN Data Flows Diagram 6.3– Support Trip.

2.4.2 Sub-Area 6.5 Prepare Trip Plan

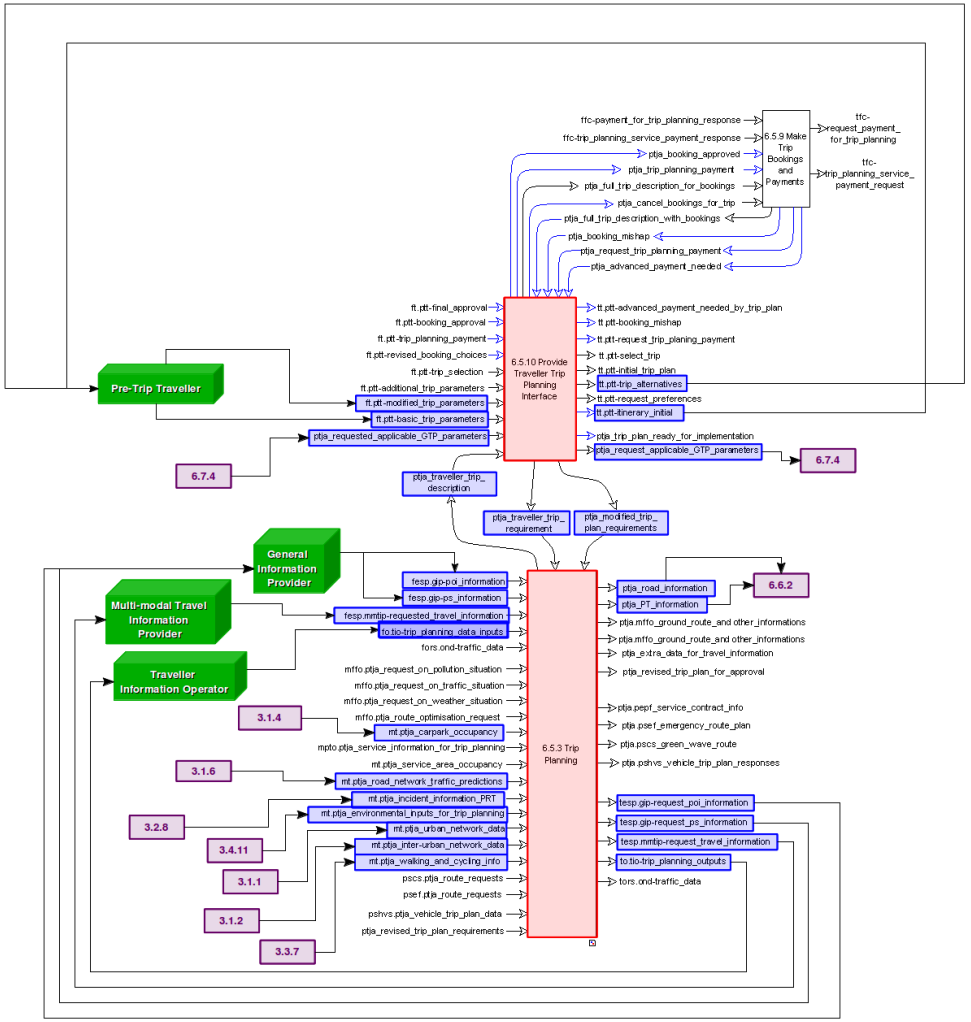

Figure 26: INTEGREEN Data Flows Diagram 6.5– Provide Trip Plan.

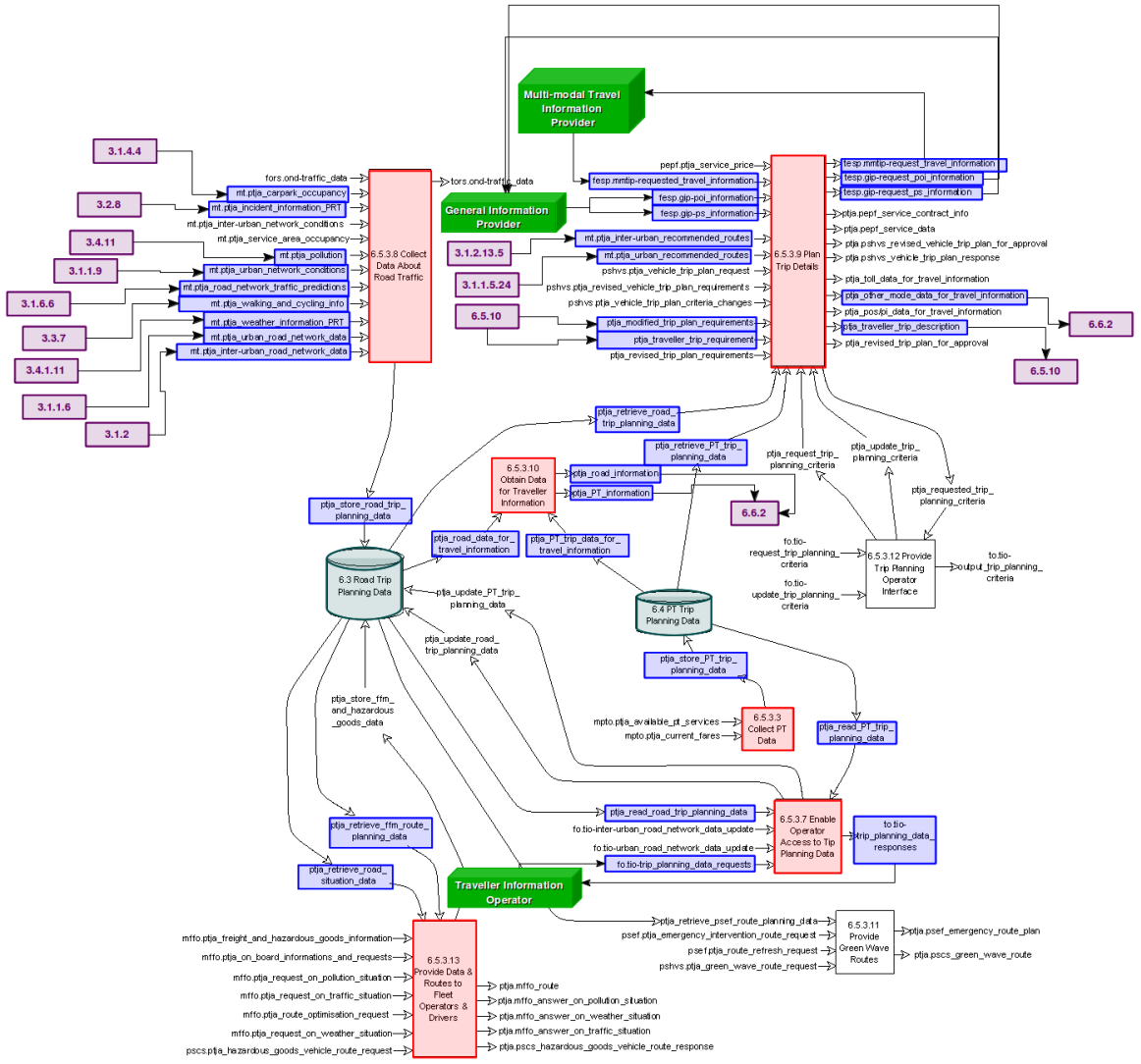

Figure 27: INTEGREEN Data Flows Diagram 6.5.3– Trip Planning.

2.4.3 Sub-Area 6.6 Provide Traveller Information

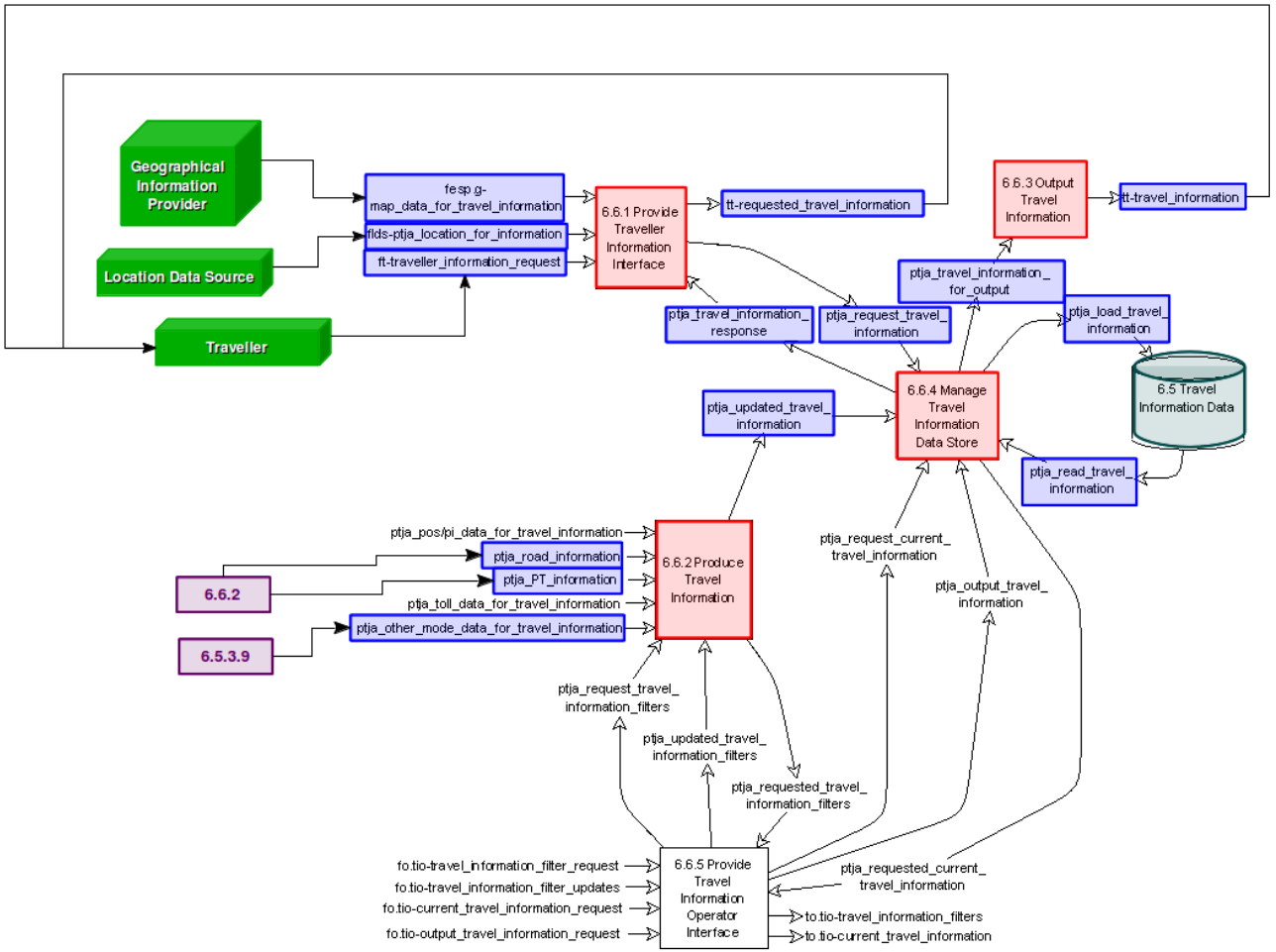

Figure 28: INTEGREEN Data Flows Diagram 6.6– Provide Traveller Information.

2.4.4 Sub-Area 6.7 Manage General Trip Preferences

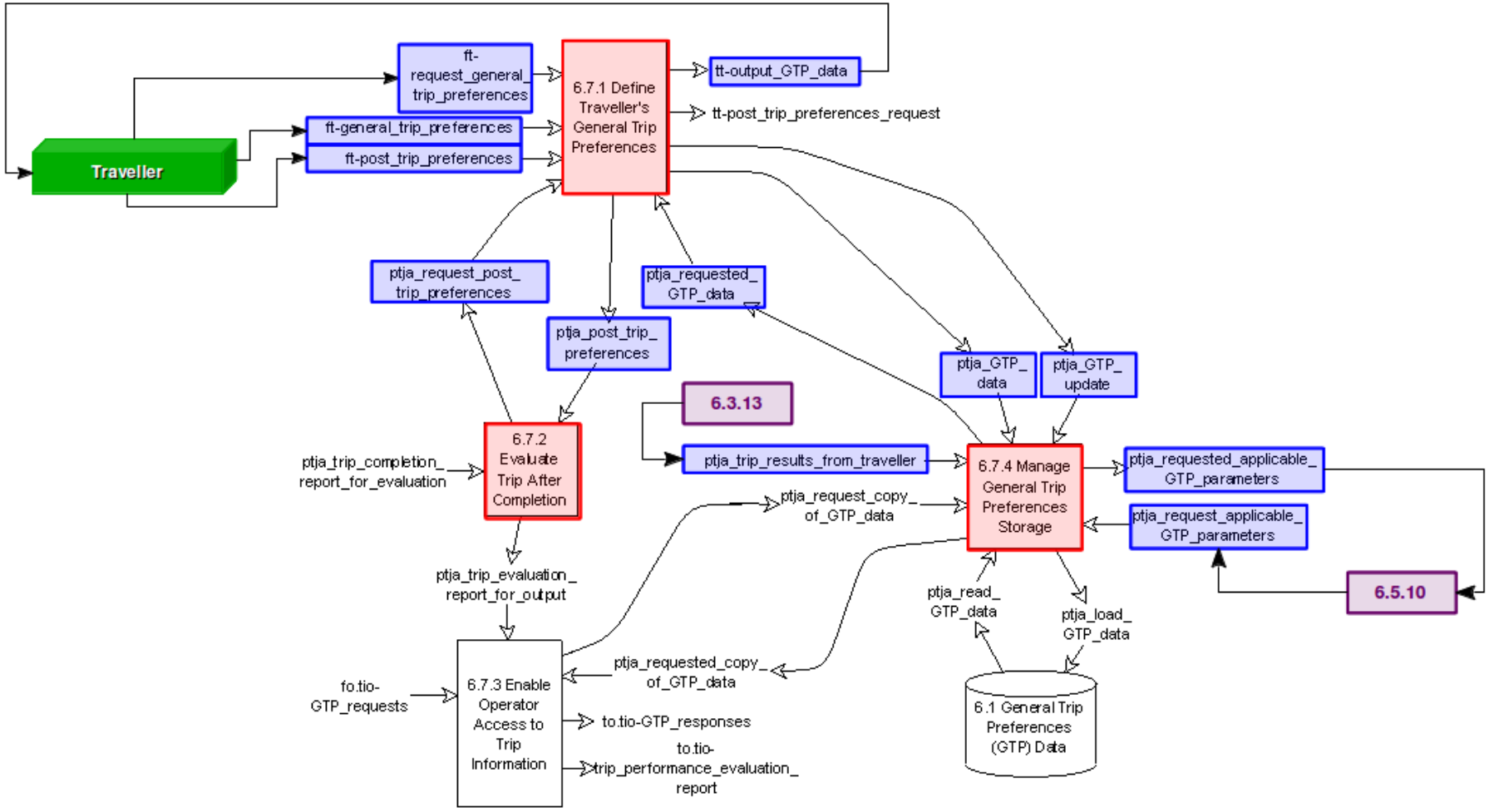

Figure 29: INTEGREEN Data Flows Diagram 6.7– Manage General Trip Preferences.