

Sustainable, Integrated public transportation network for the Maldives

Concept Paper

21 November 2008

1. Introduction

This paper gives concept of public transportation system for the Maldives. It briefly covers background of the transportation system, aims and objectives of executing a project to establish transportation system.

The type of transportation system proposed for each geographical atoll and also type of system for region has been suggested. Transportation nodes have been classed into categories to distinguish importance of such nodes and activities required at those nodes.

Elements of transportation and importance of safety regulations and required administrative setting also addressed in the paper.

Total cost of establishment of transportation system has been estimated using projects of similar nature and operational costs and expected revenue generated from land use also included.

2. Background

Maldives is an archipelago with 1190 islands grouped into 21 administrative atolls stretched along 860 kilometer of length and 80 to 120 kilometer wide. Spatial configuration of islands varies from atoll to atoll; so are the sizes, population and the distances between the islands.

There has never been a time when Maldivians stayed in their islands without travelling; they travelled within the country as well as to neighboring countries. Sea transportation was dominant in the country. Current modes of transportation system include land based vehicles, sea and air transport.

Usual form of sea transportation has been by private dhonis (boats specially designed in the Maldives) mostly dedicated for moving cargo and fishing vessels which travel from densely populated islands to Male (capital of Maldives). Residents of islands use this facility to travel from their islands to Male. Some of those cargo vessels have dedicated space for passengers. Male' and its region has been hub of transportation in the Maldives. Public transportation exists at Male region between Male to Villingili and Hulhumaale; the demand for these connections is increasing and they are already running at maximum capacity.

There are four operational airports in the Maldives; two international and three domestic airports; where scheduled flights travel every day from Male to all the four airports. Few more domestic airports are under current development plan and one of such airport is already under construction. Total of international two way passenger traffic has hit 1.6 million this year. More than 80 per cent of this traffic is tourists. Those tourists are transported to their tourist resorts by seaplanes operated

from Male International airport to number of tourist resorts destinations or alternatively they are transferred by high speed boats from their resorts.

The nation being spread in a large area, it is very important to establish, integrated public transportation network to facilitate required accessibility and mobility of people and goods. Such mobility would assist economic growth and allow residents and visitors to explore the beautiful Maldives.

3. Aims

Primary aim of the project is to establish a new maritime/land based public transportation network to increase accessibility and mobility of people and goods by incorporating existing networks of private and public transportation networks. Such a network would ensure benefits of transportation are equally distributed and will be more focused particularly on those with special needs, lower income residents, while benefiting higher income residents and assisting economic regeneration of the atoll, the region and the country.

4. Objectives

The following broad objectives form basis of the public transportation network.

1. Increase accessibility by providing nodes of transportation network at all the islands. Increase mobility by integrating networks at atoll level to regional level.
2. Economic regeneration of the atoll by revitalization of urban setting and land-use.
3. Equal distribution of wealth and provide ways of traveling for lower income residents and people with special needs while enhancing higher income category residents.
4. Improve efficiency of the system by making traveling more scheduled.
5. Make more sustainable by addressing the future needs and incorporating renewable energy concepts and state-of-the art technologies.
6. Make more cost effective by allowing service providers to build operate profitable businesses at transportation nodes.

5. Levels of transportation network

The type of transportation network proposed is loop type. This type has been found more efficient than hub-and-spoke type for medium traffic area. The transportation system shall be the following levels. As the traffic demand grows between specific destinations, direct shuttle service can be started.

1. Intra-atoll

All the islands within the atoll will be connected through ferries travelling from island to island continuously throughout the day and night. There will be set of ferries travelling clockwise from island to island while other set of ferries travelling anti-clock wise direction connecting islands A, B, C, D, E and F following scheduled timetables. This system of movement has been referred to as 'orbiters' in the Figure 1 below. Densely populated islands and airport islands may require dedicated 'shuttles' to cater for demand; island pairs such as A - D, and D - F have been connected by dedicated shuttle ferries.

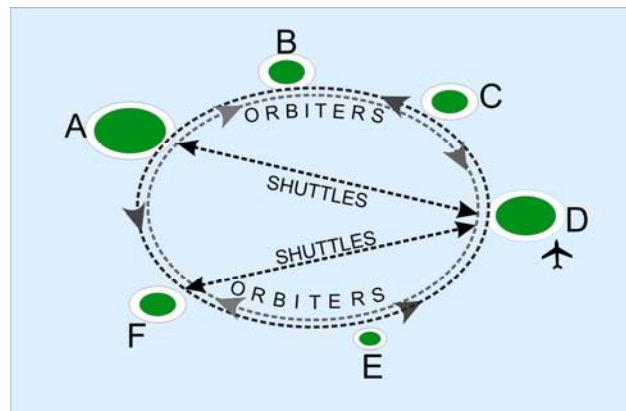


Figure 1 Typical model of intra atoll transportation network

Transportation nodes may be constructed at four levels.

Type	Name	Description and facilities at the node
1	Ferry platform	This is the basic node where no terminal facility will be attached. Berthing for at least one ferry will be required at ferry platform. Service is restricted to atoll level only.
2	Ferry terminal	Small to medium size terminal with commercial land available for development and berthing facility of at least 2 ferries. Service is restricted to atoll level only.
3	Ferry interchange	Medium to large size terminal with commercial land available for development and berthing facility of at least 4 ferries. Fair amount of cargo movement is expected through this node. This node will serve at atoll level as well to regional level.
4	Ferry Hub	Comfortably large terminal with commercial land available for development and berthing facility of at least 6 ferries. Considerable cargo movement is expected through this node.

		This node serves at atoll, regional and inter regional level.
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2. Intra-regional or inter-atoll

Similar to intra-atoll, there will be ferries connecting major islands of each atoll within the group of atolls in the region. Major islands of atolls A, B, C and D will be connected by orbiters and dedicated shuttles will connect densely populated islands within the region, especially to airport islands.

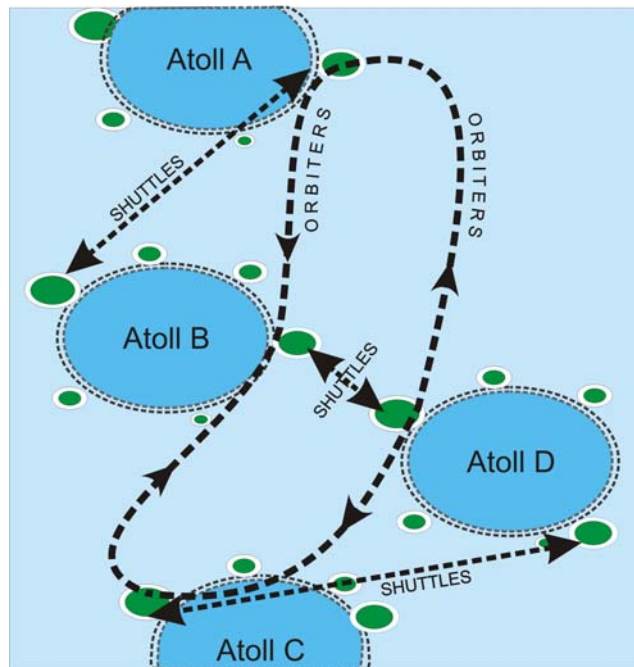


Figure 2 Typical intra regional or inter atoll transportation network

3. Inter-regional

Figure 3 shows typical of transportation system at inter regional (national) level. At national level transportation will be by sea as well as by air. There will be ferries connection all the seven regions (numbered from 1 to 7) while a direct shuttle connecting the farthest two atolls with high speed liner. When the system is fully developed, domestic airports for regions and international ports will be developed, facilitating direct connection of those area with neighboring countries.

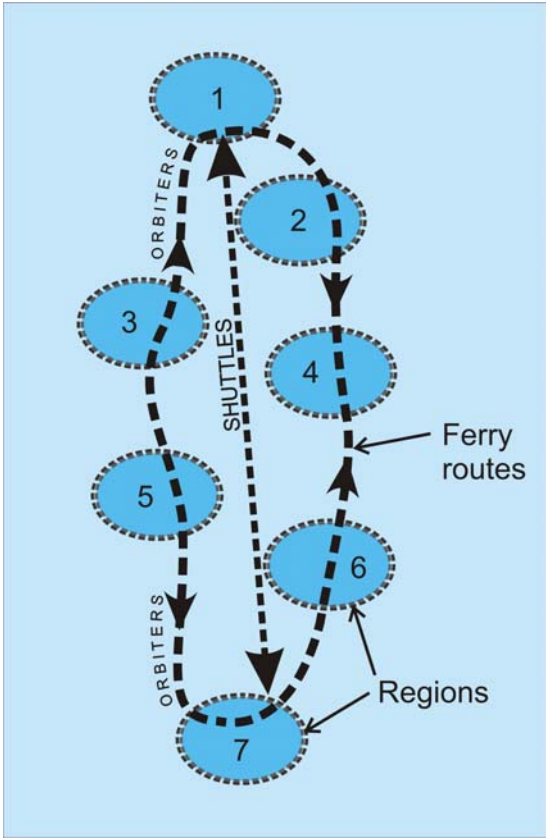


Figure 3 Transportation at inter regional or national level

6. Elements of transportation network

The following are the primary elements of this transportation network.

1. Ferry terminal associated with its land-use, jetty and harbor

It is required to have adequate capacity harbor, jetties and terminal for the operation of the system. The terminal area requires to be developed to activities which would generate finance to sustain operation of the ferries. The following matrix describes based on demography ways of allocating activities to this facility. The whole facility will be given on long term lease and agreements would facilitate him to sub lease the spaces to generate income.

Table 1 Matrix showing Land–use and population of the island at transportation node (ferry terminal)

Land use/ Population	>2000	700 to 2000	Less than 700
Super markets	X	X	X
Shops/Mall	X	X	X
Commercial	X	X	X
Cinema	X	X	-
Water front	-	-	X
Local Markets	X	X	X
Storage facilities (godowns)	X	X	X
Guest houses	X	X	-
Institutional (office, etc)	X	X	-
Recreation, leisure park	X	X	X

The magnitude of space to be allocated for ferry terminal and ancillary facilities shall be based on factors such as population of the region, total area of island, space available for development and strategic location of the island in the transportation network. Although certain activities have been listed in the above matrix, it is allowed to the service provider to propose a more suitable business plan for him to sustain the required services.

2. Ferry

The size and quality of ferry will have to be agreed between the operator and the local transportation authority. Primary aim of the ferries shall be transportation of passengers. Comfortable seating shall be provided for the passengers. Space for one check-in baggage and one land luggage requires to be provided for each passenger. From time to time the quality of services of the ferries in comparison to the demand will be reviewed by the local authority and the services provider need to comply with all such request of the local authority.

Provision of ferries, staffing, operation and maintenance will be carried out by the transportation service provider of that region.

3. Routes and frequency of ferries

The routes of ferries will be time to time reviewed by the local authority. The timing of ferries need be arranged following time tables published by the operator under the guidance of local authority.

4. Fare

Fare will be kept very low by giving the service provider land and other opportunities to cross subsidize expenses all services related to design, build, manage, operate, maintain, repair and upgrade. However, a value for fare will be decided to stop abuse of the facilities; which may

happen if given free. Fare system shall be organized in such a way that it is convenient for the travelers to take passes to which can be used for all the routes he requires. School children, elderly and handicapped shall be provided with special treatments.

5. Quality of service and operations

The quality of service and operation of the terminal and associated all the facilities shall be to the standards set by the location transportation authority.

6. Safety and security of passengers

The service provider shall comply with regional authority regulations for safe travels and should ensure security of passengers. The passengers should have access to and be made available safety procedures during their travel.

7. Administration

A local authority shall be established with sufficient human resources to monitor the service provided by the transportation service provider. Such authority should ensure all the transportation within the region complies with national transportation laws, regulations and standards.

7. Land acquisition

If the land and space appropriate to build the transportation facility has already been allocated for other purpose, the residents shall assist local authority to procure the land.

8. Administration

Branches of local authority shall be established preferably at each node of transportation network. The administration of the system shall be of routine check rather than day to day engagement with service provider. All information about travel, transportation shall be recorded and archived.

9. Financing

Financing will be decided in consultation with Interested Transportation Service Provider. It is assumed that the packaging of transportation may be in such a way that it is attractive to the parties already established in the region. For the capital investment of the service provider, the government may assist him to secure finance.

During the operation of the facility it is expected that the service provider to generate sufficient finance from the economic activities from the land to sustain transportation service network under his responsibility.

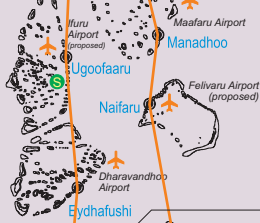
10. Next phase

It is required to produce Request for proposals (RFPs) for different regions of the transportation system and those RFPs can be released to interested potential parties to prepare their proposal. Such RFP should encompass all the relevant data about the region which would facilitate the interested party to prepare their business plan. If certain data is not available then, the RFP should clearly indicate such scenarios.

Region 1



Region 2



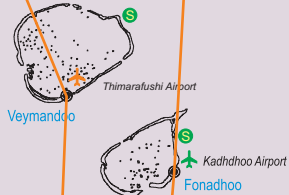
Region 3



Region 4



Region 5



Region 6



Region 7



INTER-ISLAND PUBLIC TRANSPORTATION NETWORK

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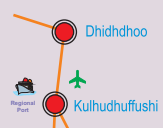
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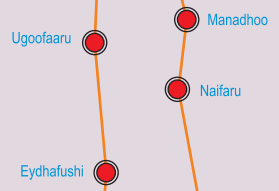
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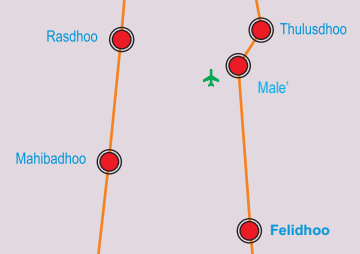
Region 1



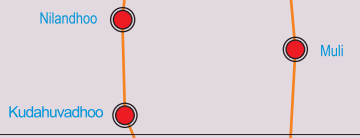
Region 2



Region 3



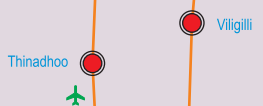
Region 4



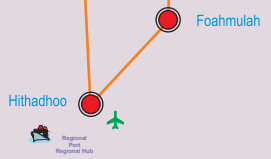
Region 5



Region 6



Region 7



INTER-ISLAND PUBLIC TRANSPORTATION NETWORK

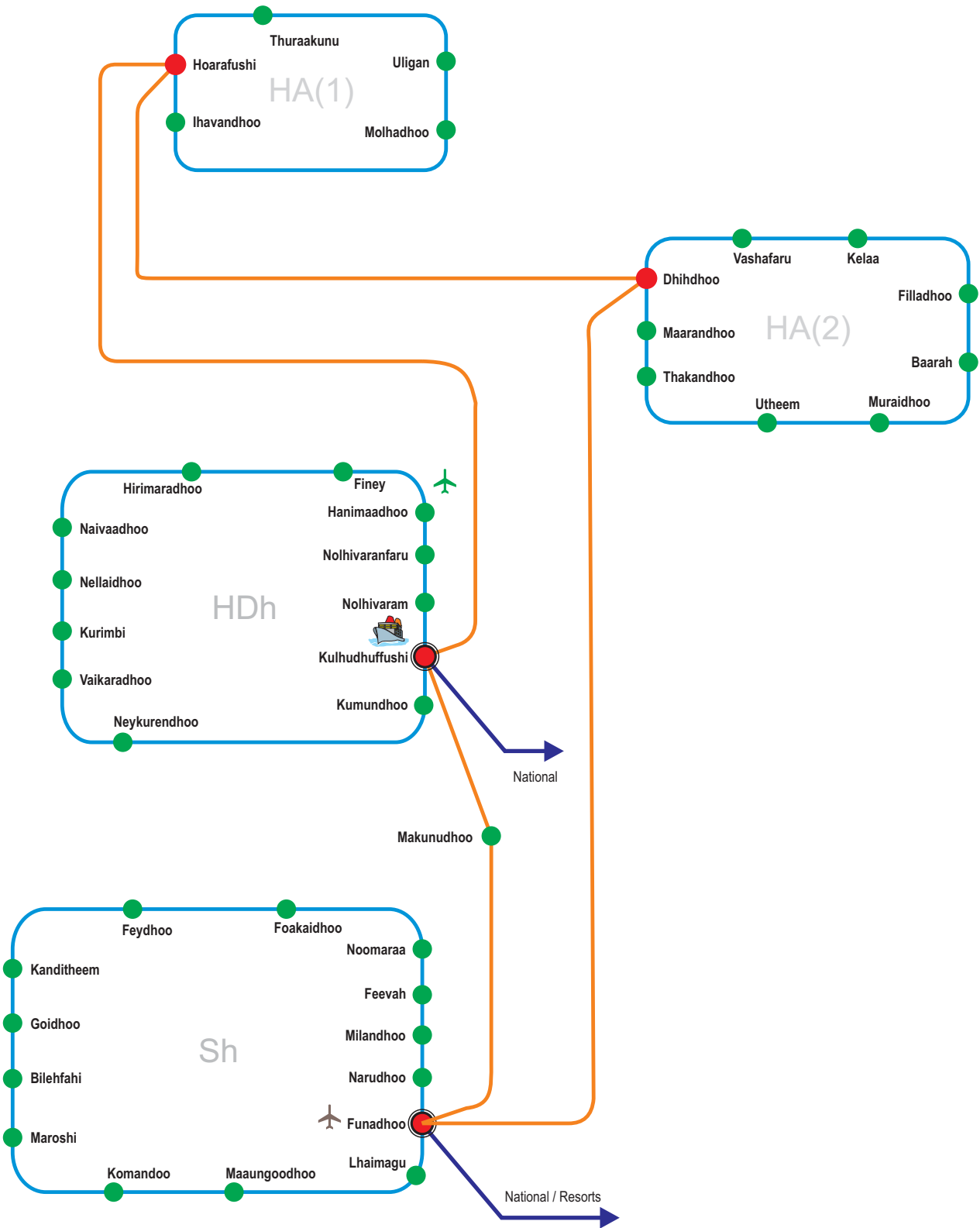
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INTER-ISLAND TRANSPORTATION NETWORK

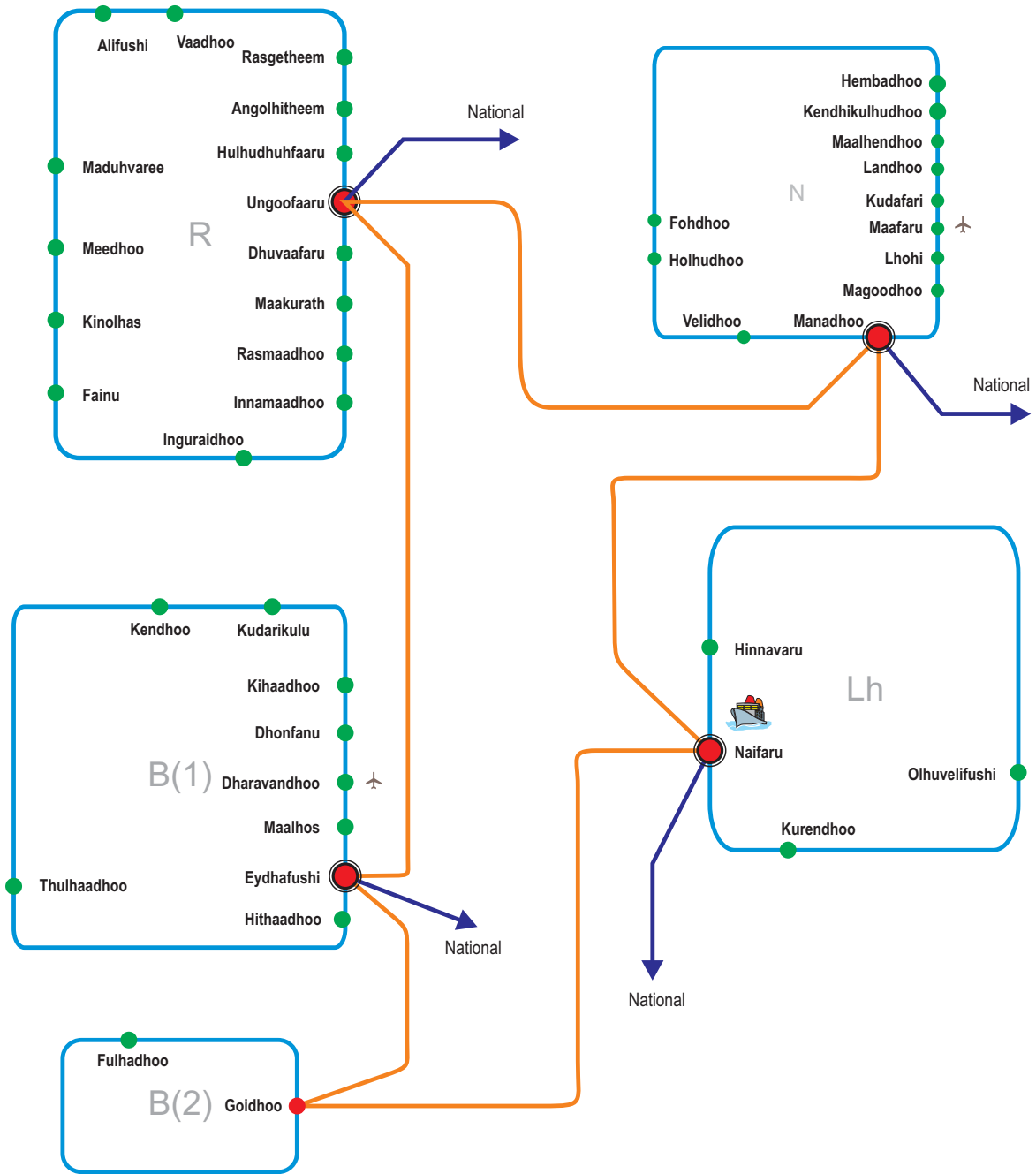
REGION 1: Haa Alif, Haa Dhaalu, Shaviyani



- Legend:
- intra-atoll ferry
 - intra-region ferry
 - ferry terminal / ferry platform
 - ferry interchange
 - ferry hub

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INTER-ISLAND TRANSPORTATION NETWORK REGION 2: Noonu, Raa, Baa, Lhaviyani

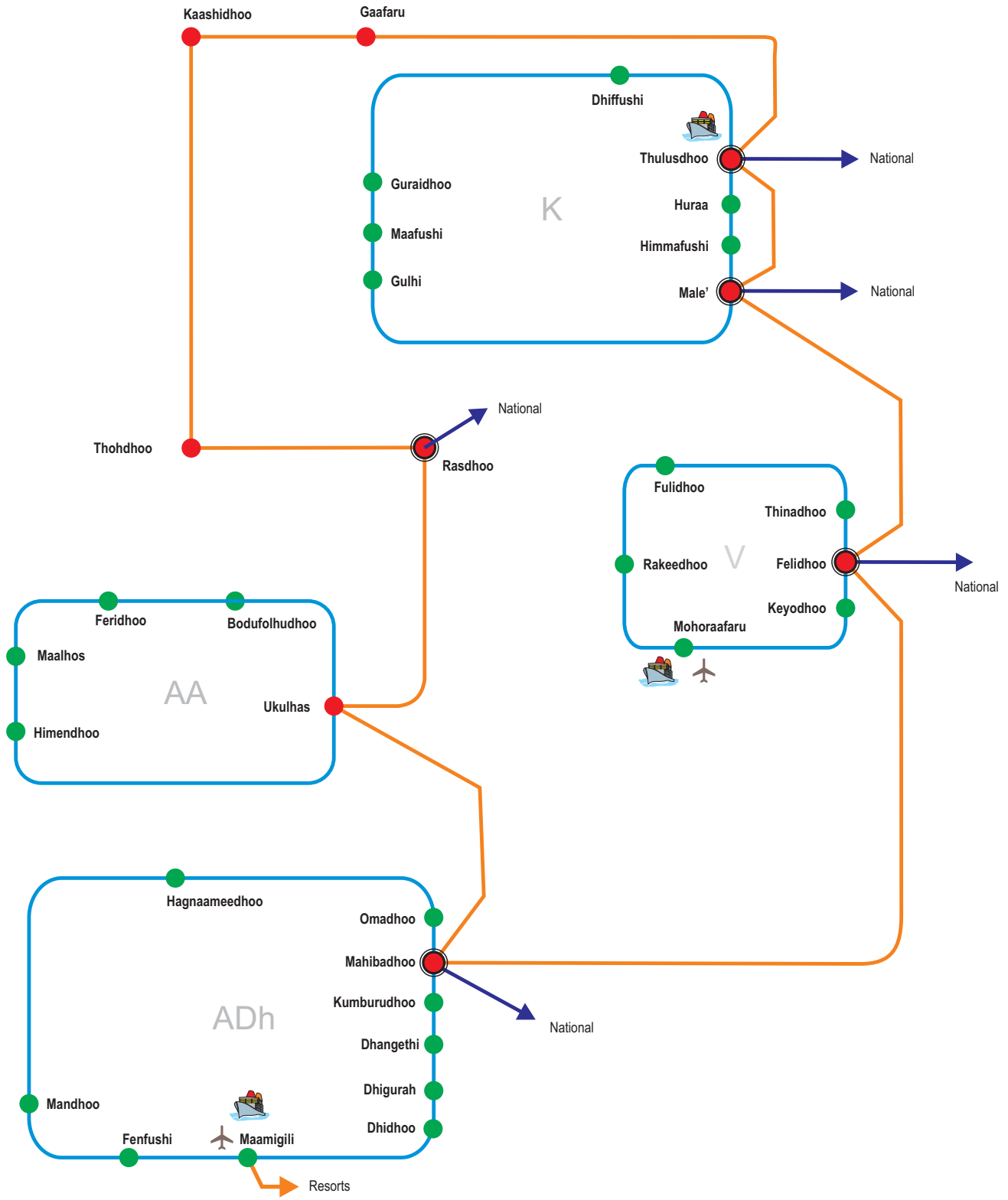


Legend:

- intra-atoll ferry
- intra-region ferry
- ferry terminal / ferry platform
- ferry interchange
- ⊙ ferry hub

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INTER-ISLAND TRANSPORTATION NETWORK REGION 3: Kaaf, Alif Alif, Alif Dhaalu, Vaavu

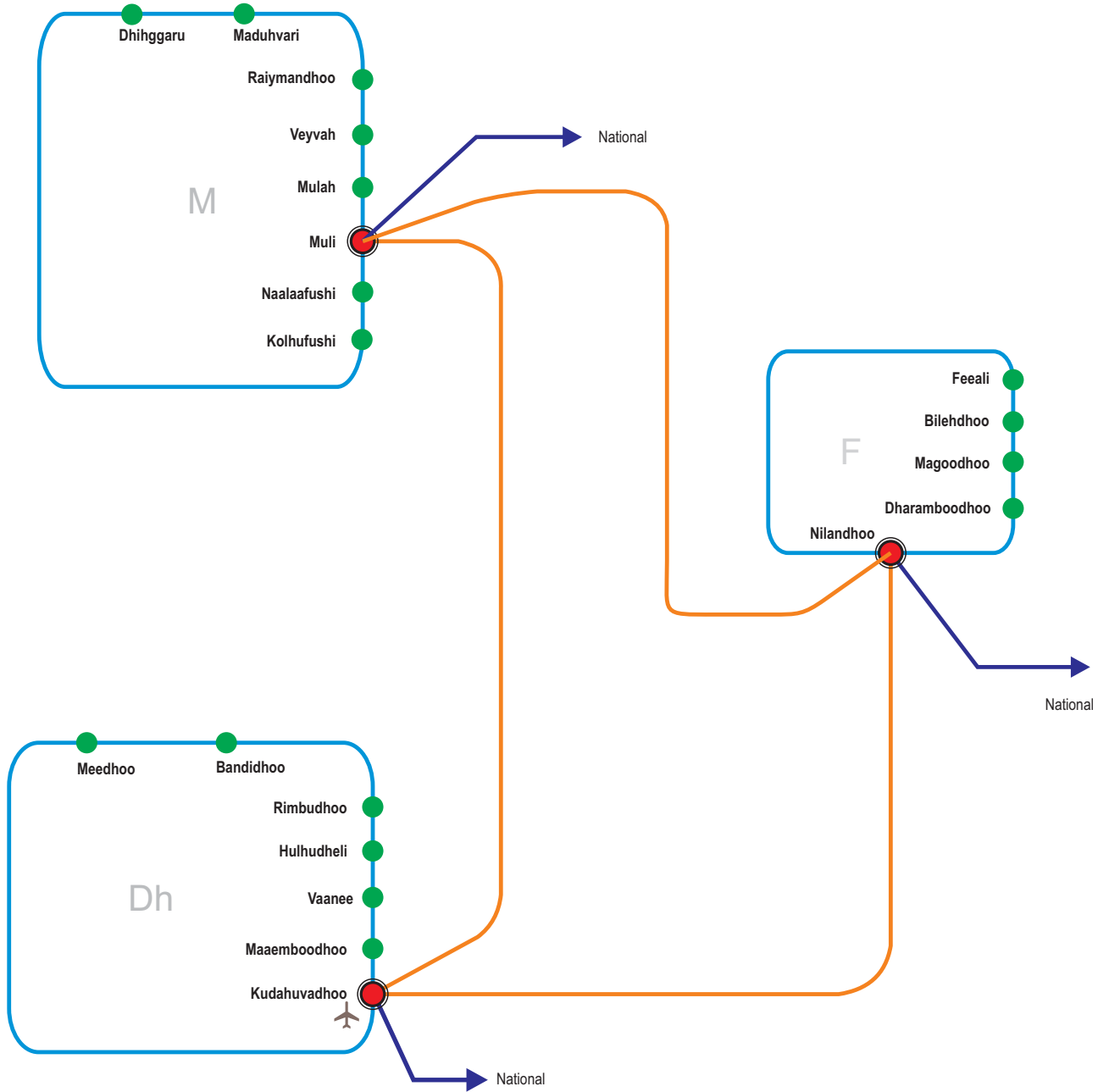


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INTER-ISLAND TRANSPORTATION NETWORK REGION 4: Meemu, Faafu, Dhaalu

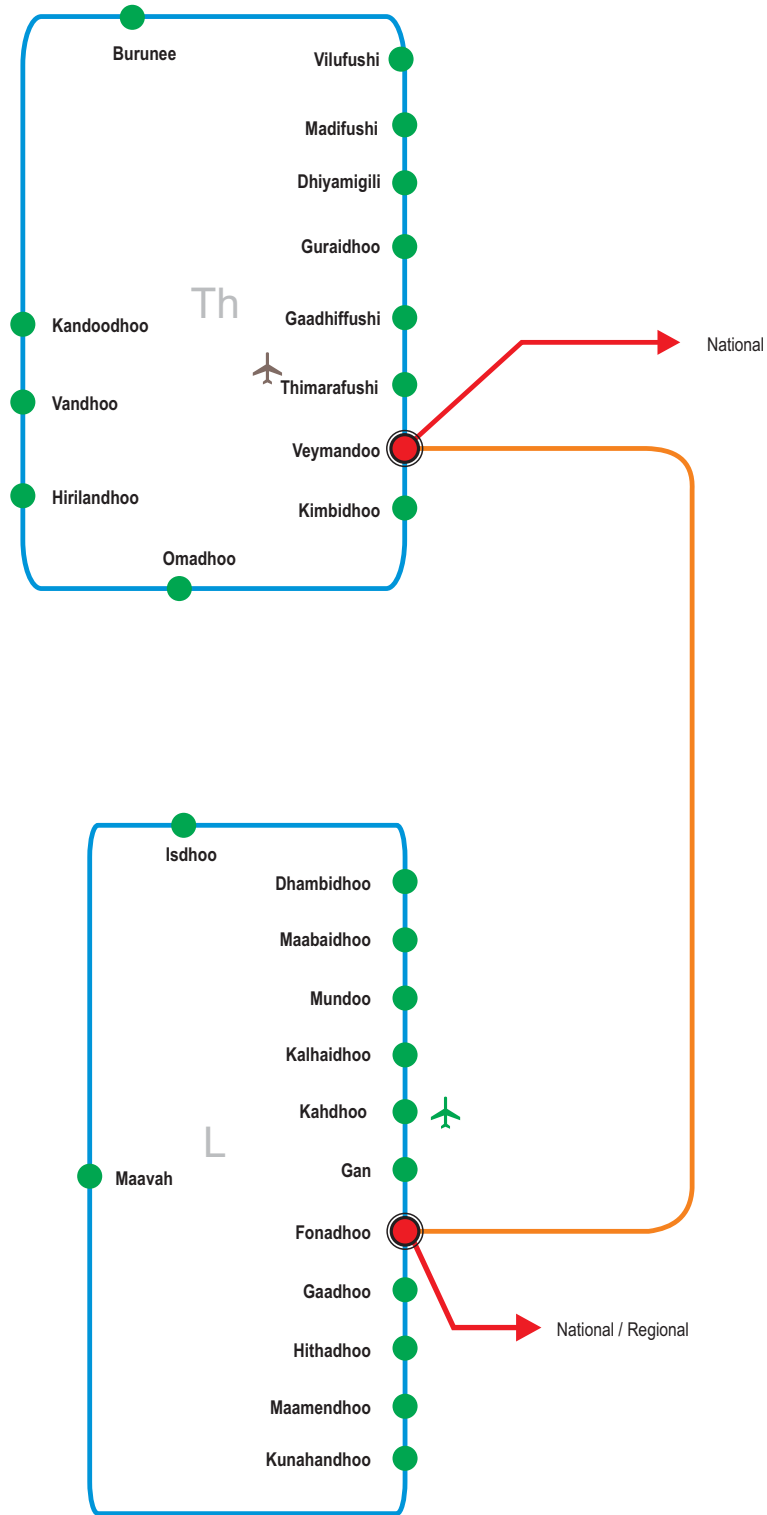


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INTER-ISLAND TRANSPORTATION NETWORK REGION 5: Thaa, Laamu

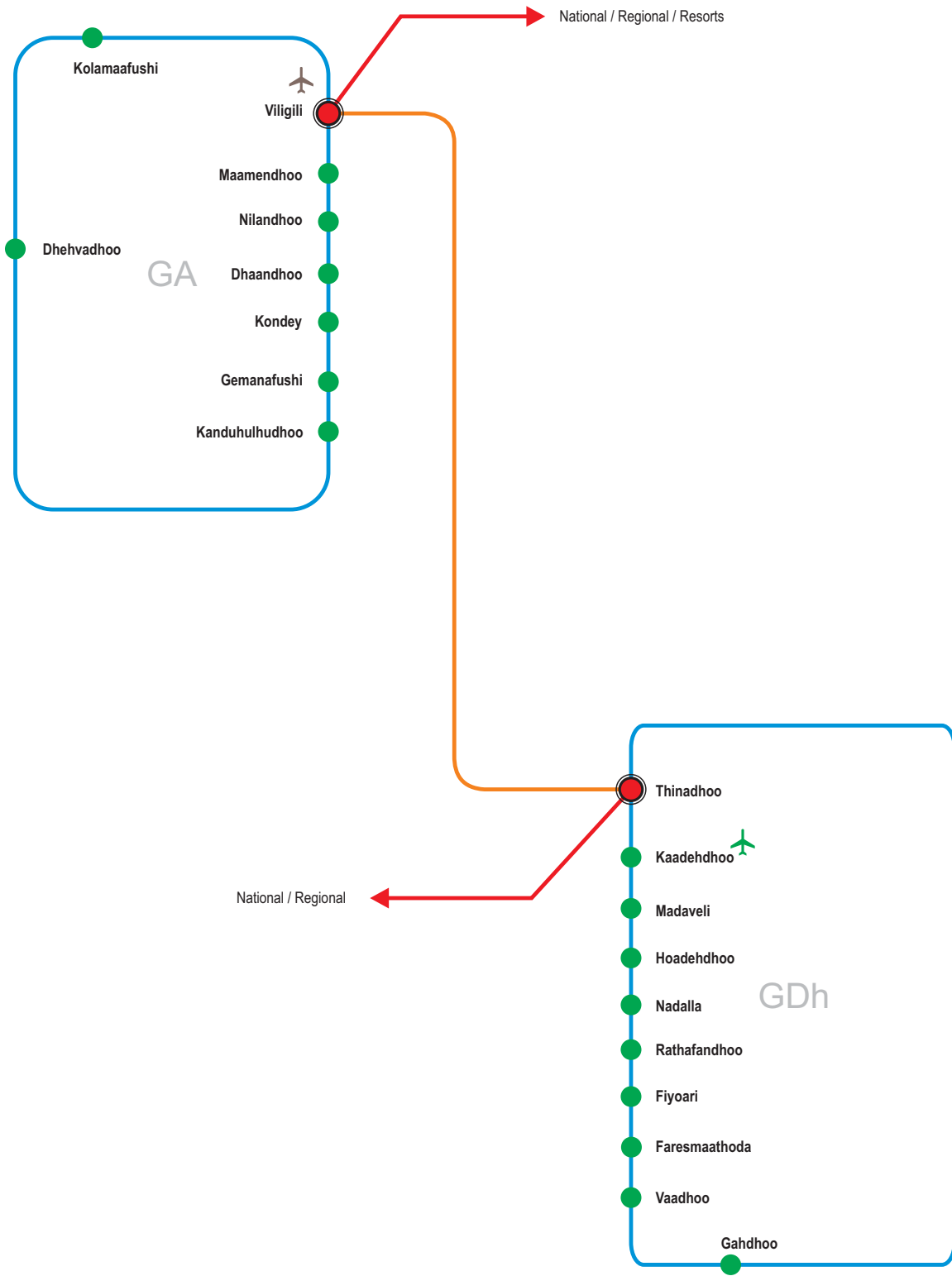


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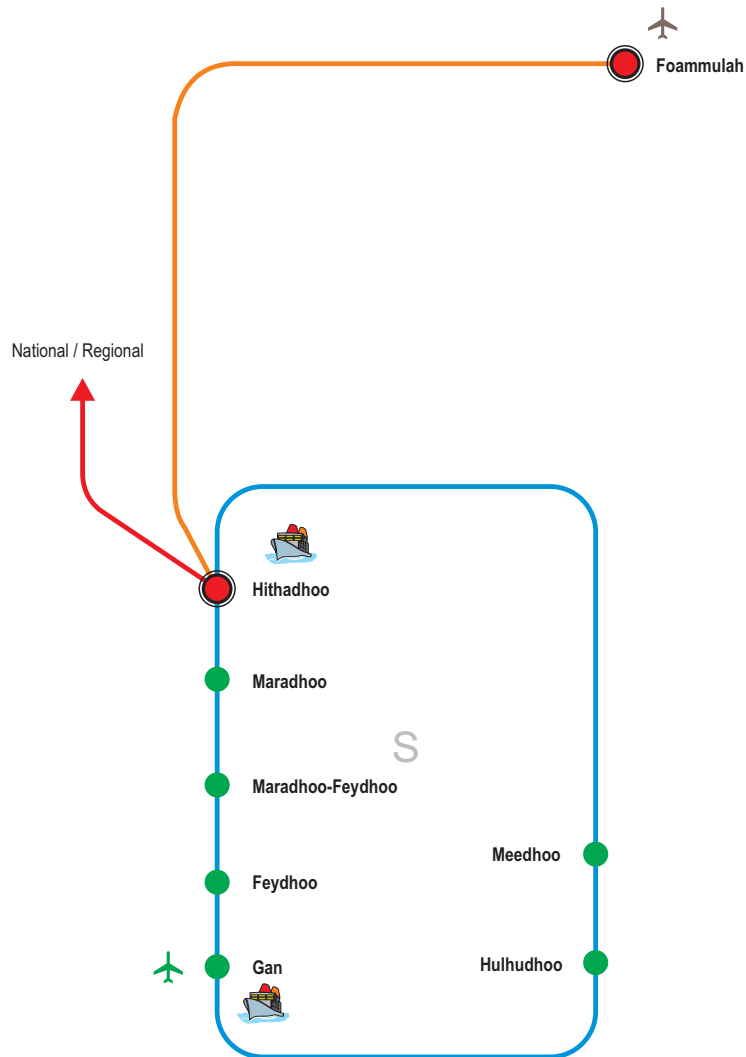
INTER-ISLAND TRANSPORTATION NETWORK REGION 6: Gaaf Alif, Gaaf Dhaalu








- Legend:
- intra-atoll ferry
 - intra-region ferry
 - ferry terminal / ferry platform
 - ferry interchange
 - ferry hub

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INTER-ISLAND TRANSPORTATION NETWORK REGION 7: Foammulah, Addu



Legend:

-  intra-atoll ferry
-  intra-region ferry
-  ferry terminal / ferry platform
-  ferry interchange
-  ferry hub

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