Chapter 04
Water Esplanades Development Strategy

Water Esplanades

Strategic Interventions to activate Water Esplanades

Future Possible Impacts of Water Esplanade Development Strategies

Chapter 04

Water Esplanades Development Strategy

'Transforming Waterfronts into City Front-yards'

08 Water Esplanades to activate Aquarina

Water Esplanades Development Strategy

Introduction

Water Esplanade Development Strategy is the main strategy proposed to activate the Seven Aqua Regions identified in the proposed Concept Plan in order to achieve the envisioned vision of '***Aquarina – The City in Water***'.

Objective

The main objective of this strategy is to expose the waterfronts of *Colombo Commercial City* as the city front yards and promote them for investments.

Urban waterfront revitalization has been steadily extending in many cities worldwide. Nowadays, waterfront redevelopment is a global trend and thousands of schemes are being carried out in large metropoles, medium-sized cities, and even small towns all over the world. Due to their advantageous location at the interface between built environment and water, near the city centers, waterfronts provide highly exploitable urban spaces for new uses like large-scale office, leisure and residential projects.

Approach

Water Esplanade Development Strategy is proposed to be implemented in the real grounds in terms of three approaches such as;

- **Regulatory approach**
  (including policies and regulations imposed by relevant state agencies)
- **Direct interventions of state agencies**
- **Collaborative approach**
  (including direct private investment & public-private partnerships)

Contribution towards the Vision & Goals of CCCDP – 2019-2030

The proposed Water Esplanade Development Strategy contributes to achieve the goal – ***The most sought Water-front Business Environment Experience in the World*** and its subsequent objectives as mentioned below.

Objective 01 – To open up 125km length of various water and wetland fronts
Objective 02 – To open up 3000 ha of lands in waterfronts for developments
Objective 03 – To have a well connecting water transportation system
Objective 04 – To strengthen continuous network of water bodies and wetlands
Objective 05 – To have a well-managed Flood Mitigation System in flood risk areas

Scope

The planning framework of the Water Esplanade Development Strategy includes:

- **A geographic scope including water fronts of all natural and man-made surface water bodies of all types within Colombo Commercial City**

- **All strategic interventions and projects having direct impact on activating identified seven aqua regions** *(However the prioritization order and timeframes of identified strategic interventions and projects are elaborated under the Implementation Strategy of CCCDP – 2019-2030.)*

4.1. Water Esplanades (Major water features based intervention areas)

Definition

Water Esplanades—The term *'Water Esplanades'* referred to a defined area of intervention; a corridor which is based on a one or more water features.

4.1.1. Eight Water Esplanades

Water esplanades will be developed at three levels based on the scale of available water features and the scale of envisaged development. The water esplanades developed at three levels are as follows.

1. Major Water Esplanades (Eminent Water Esplanades)

    I. Marina Investment Esplanade
    II. Kelani River Investment Esplanade
    III. Beira Lake Investment Circle

2. Secondary Water Esplanades (Classic Water Esplanades)

    IV. St. Sebestian Canal Investment Esplanade
    V. Dematagoda, Kinda Canal & Kirulapana Canal Investment Esplanade
    VI. Wellawatta & Dehiwala Canal Investment Esplanade

3. Tertiary Water Esplanades (Trivial Water Esplanades)

    VII. Mudun Ela Investment Esplanade
    VIII. Bolgoda Lake Investment Area

Water Esplanades

Colombo Commercial City Development Plan 2019 - 2030

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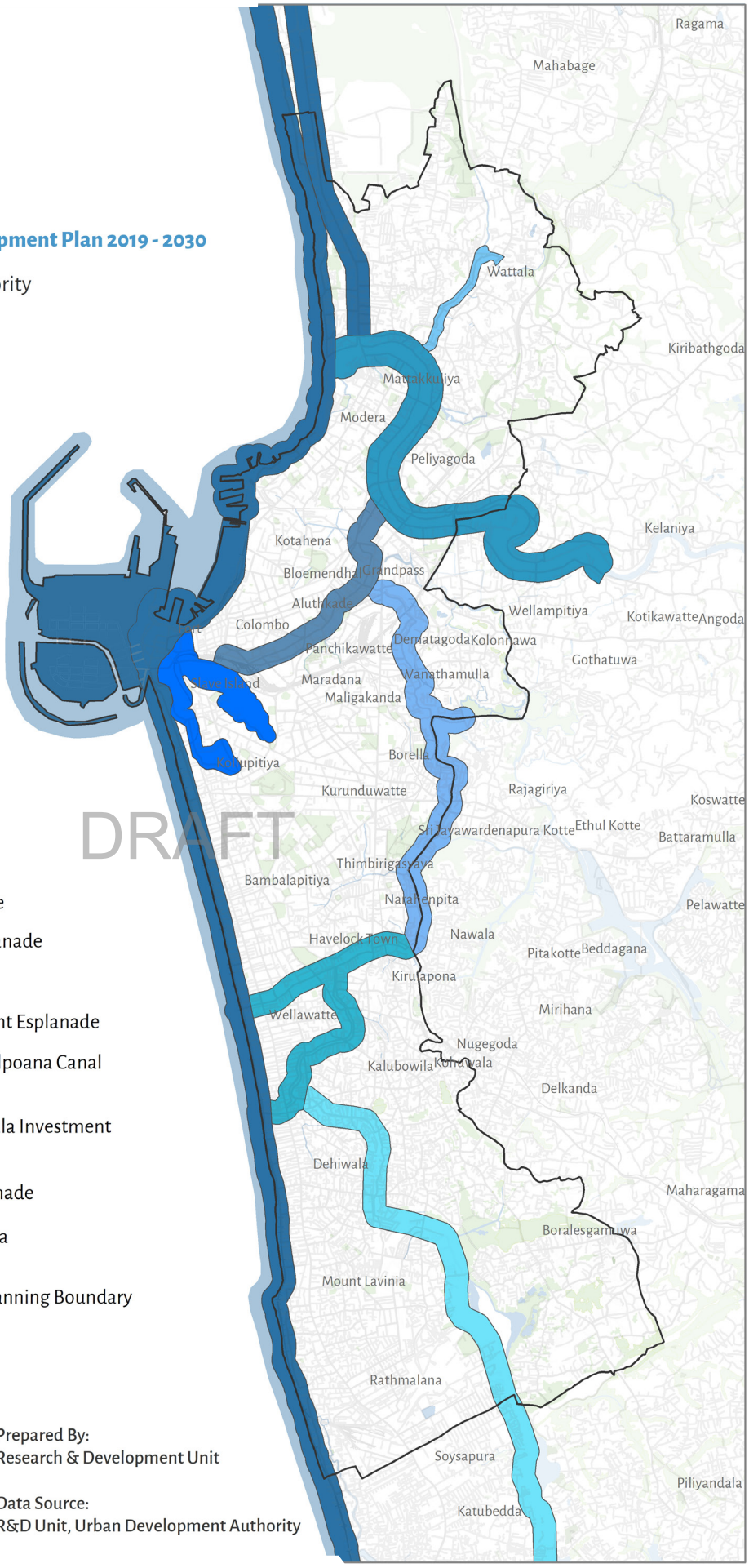

Legend

- Marina Investment Esplanade
- Kelani River Investment Esplanade
- Beira Lake Investment Circle
- St. Sebastian Canal Investment Esplanade
- Dematagoda, Kinda and Kirulpoana Canal Investment Esplanade
- Wellawatta & Dehiwala Canala Investment Esplanade
- Mudun Ela Investment Esplanade
- Bolgoda Lake Investment Area
- Colombo Commercial City Planning Boundary

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Prepared By:
Research & Development Unit

Data Source:
R&D Unit, Urban Development Authority

Map 4.1: *Eight Water Esplanades*

4.1.2. Envisaged Characters of each Water Esplanade

Category	Water Esplanade	Character	Justification
Major (Eminent)	Marina Investment Esplanade	Recreational, cultural & beach tourism and premium investment corridor	Marina Investment Esplanade will be the main strategic intervention to activate the Aqua Region 02; The Marina Corridor
	(1) Marina Investment Esplanade – Recreational Stretch (Coastal Stretch extending from Kelani River Mouth to Wattala including Hamilton Canal Environs)	Water based recreational and tourism area	This area has the potential of two main water features; Sea and Hamilton Canal. As the right bank of Kelani River mouth falls within this stretch, this area provides three different water experiences and has the potential for water-based recreational and tourism activities.
	(2) Marina Investment Esplanade – Cultural Stretch (Coastal stretch extending from Pettah Bazaar to Kelani River Mouth)	A special zone consisting of conserved various archeologically important features such as Pettah Bazaar, Kovils, Dutch Buildings and Churches	Nearly half length of this stretch is bounded by the Port wall which disturbs the view of Sea and Port. Even though, there are archeologically important buildings and sites located within this stretch, they are mostly hidden among the warehouses and industries. Pettah Bazaar has a unique character with its day-to-day functioning pattern which needs to be conserved along with its many archeologically important buildings. Given, the existence of historical Kovils and churches, importance of Pettah Bazaar which is a living heritage and the potential sea and port view, this stretch can be exposed for more investments in terms of cultural, recreational and heritage tourism and commercial developments.
	(3) MarinaInvestment Esplanade - Premium Investment Stretch (Coastal stretch extending southwards from Port City to Ratmalana)	Premium investment area attracting high end commercial, luxury residential and tourism developments. The city front-yard providing beach- side recreational and premium retailing experience.	This stretch has the potential to be the city front-yard considering the long beach stretch. North section from Fort to Wellawatta are already occupied by high-end investments such as luxury hotels, residential apartments, shopping malls etc. However, the southern section is not yet optimized and there are many ways the potential of sea-front can be harnessed exposing it for more recreational and tourism activities and for many high-end investments.

Category	Water Esplanade	Character	Justification
	Kelani River Investment Esplanade	A special regeneration zone that will be transformed into a river-front recreational, tourism and investment space.	The purpose of this water esplanade is to activate the Aqua Region 01; Kelani River Based Special Regeneration Area. Kelani River has been neglected for a long time and its true potential as the largest riverfront of the area has not been harnessed yet. The development of Colombo has occurred being concentrated to Colombo Fort, even though its origin was based on Kelani River valley. Hence, it is expected to give Kelani River its due value while optimizing its true potential.
	Beira Lake Investment Circle	The exclusive premium investment space of Colombo Commercial City	With the interventions made during last decade to clean and expose Beira Lake, now it has become the most valued and highly sought investment space of Colombo Commercial City. Hence, the purpose of Beira Lake Investment Circle is to further enhance potential of Beira Lake Waterfront and strengthen the role of Colombo CBD as the Financial Center of the country while exposing more high quality investment space.
Secondary (Classic)	St. Sebestian Canal Investment Esplanade	A Canal-front investment corridor consisting of casual retailing, recreational, tourism, office and high-rise residential space connecting Pettah & Peliyagoda, the Uptown & Downtown of Colombo.	St. Sebestian is a landmark city feature that had been there since Dutch Period. However, at present it has become a backyard and underutilized with many incompatible uses. Since, the canal links Pettah and Peliyagoda, which are very strategic locations in terms of connectivity, it has the potential to act as a major link with high development potential.
	Deamatagoda, Kinda Canal & Kirulapana Canal Investment Esplanade	A Canal-front investment corridor consisting of casual retailing, recreational, tourism, office and high-rise residential space.	The purpose of this water esplanade is to activate the Aqua Region 04; Canal based Transformation Area. Currently, more than 90% of these canals are polluted, hidden and acts as backyards of the city leading to many issues. And the surrounding area has many incompatible uses which do not harness the true potential of close proximity to Colombo CBD and existence of canal-fronts.

Category	Water Esplanade	Character	Justification
	Wellawatta & Dehiwala Canal Investment Esplanade	A Canal-front investment corridor consisting of casual and high-end retailing, recreational, tourism, office and high-rise residential space.	The purpose of this water esplanade is to activate the Aqua Region 05; Canal Based Development Area. This region is already a trending premium development area. However, the canal-fronts still remain underutilized and act as backyards. If these are exposed and linked with valued lands, it will further enhance the land values and attract more investments to the area.
Tertiary (Trivial)	Mudun Ela Investment Esplanade	A Canal-front exposed for recreational purposes, casual retailing and high-quality residential space	Falling within the Aqua Region 01; this water esplanade will be a local attraction corridor which acts as a public open recreational space for the neighboring residential areas. Also, its canal-front will be opened up for casual retailing and high-quality residential space such as garden housing.
	Bolgoda Lake Investment Area	A special recreational tourism and high- quality residential area	Bolgoda Lake is one of the largest water potentials of *Colombo Commercial City*. Having located considerable distanced from Colombo CBD, this area is less congested and peaceful and has a high demand and reputation for high-quality residential neighborhoods and garden houses. The purpose of this water esplanade is to expose hidden waterfronts and further enhance the value of the area.

Table 4.1: *Eight Water Esplanades – Characters & Justifications*

4.2. Strategic Interventions to activate Water Esplanades

The following strategic actions are proposed for the overall activation of identified Water Esplanades.

4.2.1. Cleaning & improving of the existing water network

The canal network of *Colombo Commercial City* is nearly 53km in length and plays an important role in maintaining the overall stream order of the entire network of water bodies. It was identified during the situation analysis, that more than 90% of water network of *Colombo Commercial City* is polluted. The present status of water network is contrasting to the future expectation; hence, cleaning of all polluted canals is considered as a first priority action in the implementation of *Colombo Commercial City* Development Plan.

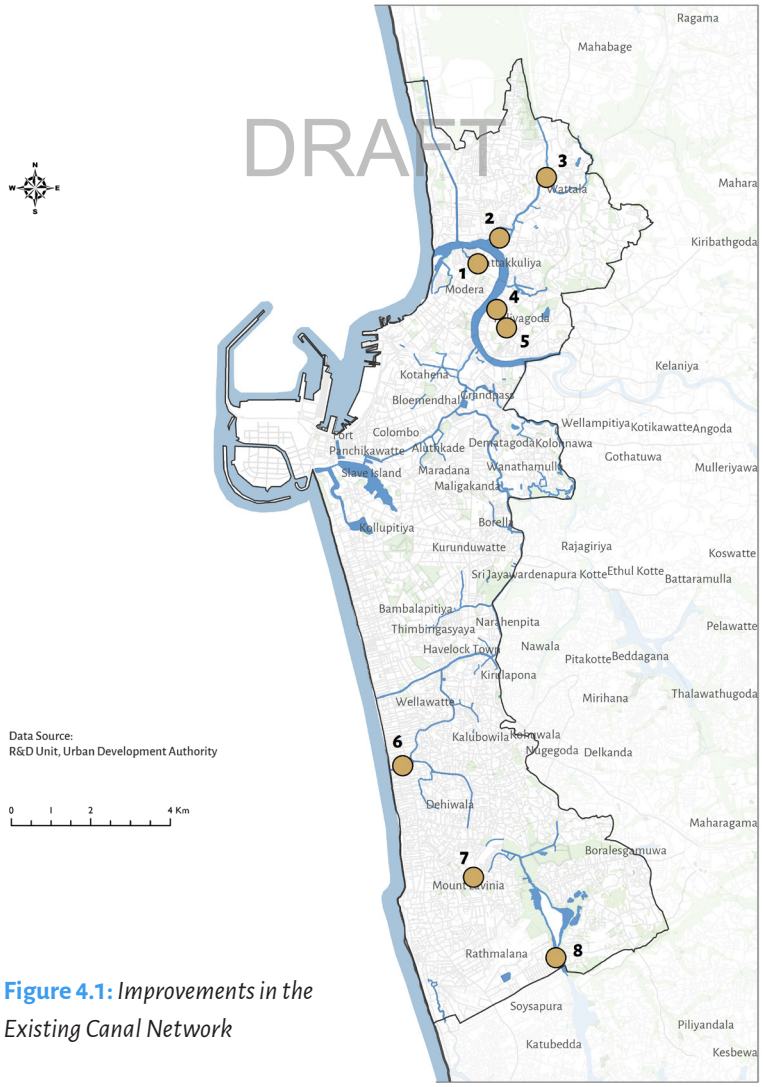

Figure 4.1: *Improvements in the Existing Canal Network*

The continuity of waterbodies is considered as an important aspect in ecological terms and also for the natural flood management. Even though, the stream order is maintained there are some missing links within the existing canal network as mentioned in the Figure 4.1 and Table 4.2 due to encroachments. Hence, it is proposed to remove the unauthorized developments on canal reservations and dredge the filled portions of canals to ensure the existence of natural widths.

No.	Natural Width (m)	Existing Width (m)	Encroached Length (m)
01	15	5-10	400
02	25	15	80
03	15	14	200
04	24	2-10	220
05	26	11	70
06	26	10	250
07	33	8	18
08	17	8	220

Table 4.2: *Identified Encroachments in Existing the Canal Network (Encroached lengths and widths)*

Derived Projects – Water Esplanade Development Strategy – Action Projects Type 01 – (W-1)

Project Code	Project Name
W-1	Cleaning & connecting of missing links of the existing water network
W-1-1	Cleaning of all water bodies of Colombo Commercial City
W-1-2	Improvement of existing canal network of Colombo Commercial City by reclaiming encroached parts

Table 4.3: *Derived Projects – Water Esplanade Development Strategy – Action Project – (W1)*

4.2.2. Maintaining the reservations of all water bodies of Colombo Commercial City

Maintenance of reservations of all water bodies including Kelani River, Beira Lake, coast and all canals is considered as a mandatory action in order to achieve the anticipated vision; Aquarina – The City in Water.

In the existing situation, the regulatory guidelines for maintenance of canal reservations which have been introduced by the Sri Lanka Land Reclamation & Development Corporation are enacted by the Gazette Notification No. 1662/17 dated 14th July 2010. As per the Gazette Notification, the specified reservations based on canal surface widths are as follows.

Surface Width of the Canal (m)	Reservation to be kept from the edge of the Canal Bank	
	For open canals (m)	For canals with covered surfaces
1.0 to 1.2	1.0	0.3
1.3 to 3.0	2.0	1.0
3.1 to 4.5	2.75	1.0
4.6 to 6.0	3.5	1.5
6.1 to 9.0	4.5	1.5
Above 9.0	6.5	2.0

Table 4.4: *Specified Canal Reservations applicable for all canals in Colombo Commercial City*

The declared reservation of Kelani River is 60 ft from river banks as per the Irrigation Ordinance (1924) and Irrigation Act (1951) and Flood Protection Ordinance (1971). The reservation of Beira Lake is 6.5m from the Lake Banks as declared by the Sri Lanka Land Reclamation & Development Corporation.

As per the Act No. 57 of 1987, the Coastal Zone is declared as 'the area lying within a limit of 300m landward of the mean high-water level and a limit of 2 km seaward of the mean low water level. In the case of rivers, streams, lagoons or any other body of water connected to the sea either permanently or periodically the landward boundary extends to a limit of 2km measured perpendicular to the straight base line drawn between the natural entrance points.' The developments coming within this zone should obtain the development clearances and permits from the Coast Conservation Department.

4.2.3. Exposing the existing water network by introducing water drives, linear parks and gateway boulevards

The right exposure of water bodies is a mandatory pre-requisite to induce waterfront developments. Hence, three major interventions will be carried out to expose and connect the waterbodies with major roads, nodes and other public spaces.

a) Water Drives along Coast, Rivers and Canals (Project Code - WT-1)

There will be three types of Water Drives such as eminent, classic and trivial depending on the type of water esplanade they fall into. A Water Drive refers to a road which runs parallel to a water body such as sea-front, rivers, canals or lakes.

Figure 4.2: *A Conceptual Image of Proposed Water Drives*

- *The Eminent Water Drives*

The eminent water drives are proposed at either side of Kelani River, Marine Drive and at the Beira Lake surroundings.

- *The Classic Water Drives*

The water drives proposed along canals will belong to classic water esplanades thus will be known as Classic Water Drives. The Lake Drive which currently runs along Kirulapana Canal will be continued southwards up to Wellawatta and Dehiwala Canals and northwards upto Wattala via Kinda, Dematagoda and Kolonnawa Canals. Another Classic Water Drive is proposed along St. Sebestian Canal and this will be a major link which connects Pettah and Peliyagoda, the Uptown and Downtown of Colombo.

- *The Trivial Water Drives*

The road proposed along Mudun Ela at Wattala will be a trivial water drive as per the category of water esplanade it belongs to.

All water drives are fallen under the Level 01 Road category as per the proposed road hierarchy. The road widths will depend on the type of waterbody and the configuration of the road in relation to the waterbody. The total length of water drives within *Colombo Commercial City* will be 86 km. All water drive projects will be aligned under Water Esplanade Development & Transport Development Strategies – Combined Action Projects with the project code (WT-1).

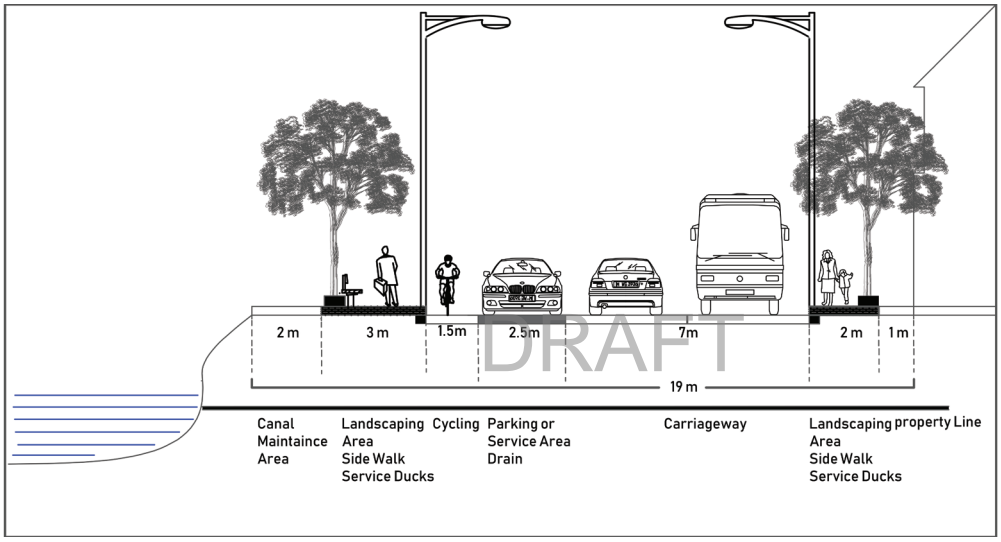

Figure 4.3: *A cross-section of a Water Drive (Eminent Water Drive / Level 01 – General Water Drive)*

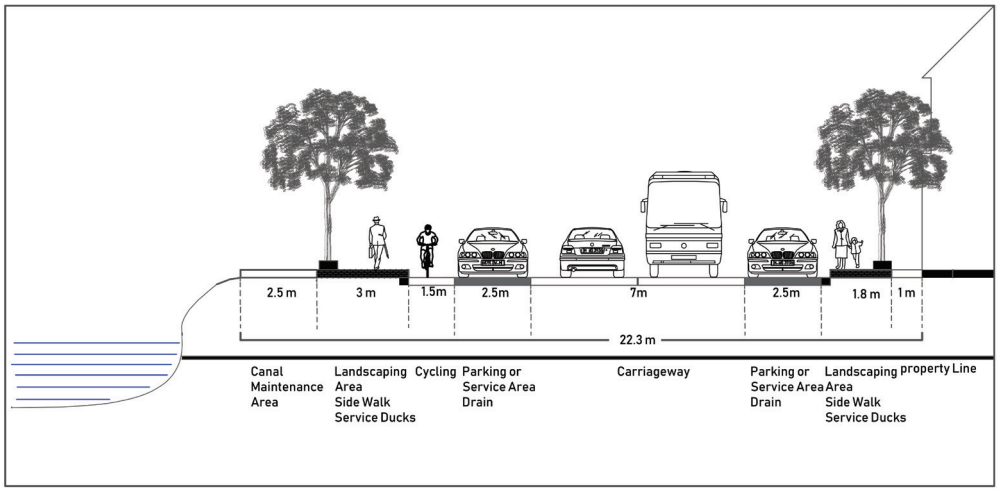

Figure 4.4: *A cross-section of a Water Drive (Classic Water Drive / Level 01 Functional Water Drive)*

Type of Water Drive	Name of Water Drive	Locations / Routes	Length of Water Drive	Width of Water Drive (Carriage Way)	Type of Road as per the Road Hierarchy	Project Code
Eminent Water Drives	Kelani River Right Bank Water Drive	Right Bank of Kelani River	8.4 km	7 m	01 - b	WT-2-1
	Kelani River Left Bank Water Drive	Left Bank of Kelani River	4.8 km	7 m	01 - a	WT-1-1
	Hamilton Canal Drive	Along Hamilton Canal from Mattakkuliya to Wattala	4.4 km	7 m	01 - b	WT-2-2
	Sea Street	Pettah to Crow Island	4.7 km	7 m	01 - b	WT-2-3
	Marine Drive	Colombo Plan Road - Along Sea-front from Fort to Ratmalana	15.5 km	14 m	01 - b	WT-2-4
	Beira Lake Drive	Along the Perimeter of the Beira Lake	8.9 km	14 m	01 - a	WT-1-2
Classic Water Drives	St. Sebestian Canal Drive	Along the St. Sebestian Canal from Pettah to Peliyagoda	4.4 km	7 m	01 - b	WT-2-5
	Extended Lake Drive	Connecting Wellawatta and Wattala via Narahenpita, Kolonnawa and Peliyagoda along Wellawatta Canal, Kirulapana Canal, Kinda Canal, Heen Ela, and Kittampahuwa Canal (Kolonnawa Canal)	22.0 km	7 m	01 - a	WT-1-3
	Dematagoda Canal Drive	Along Dematagoda Canal	3.6 km	7 m	01 - a	WT-1-4
	Dehiwala Canal Drive	Along Dehiwala Canal	3.8 km	7 m	01 - a	WT-1-5
Trivial Water Drives	Bolgoda Canal Drive	From Dehiwala to Attidiya along Bolgoda Canal	3.0 km	7 m	01 - a	WT-1-6
	Mudun Ela Water Drive	Along Mulun Ela in Wattala	2.5 km	7 m	01 - a	WT-1-7

Table 4.5: *The list of proposed Water Drives*

Proposed Water Drives - 2030

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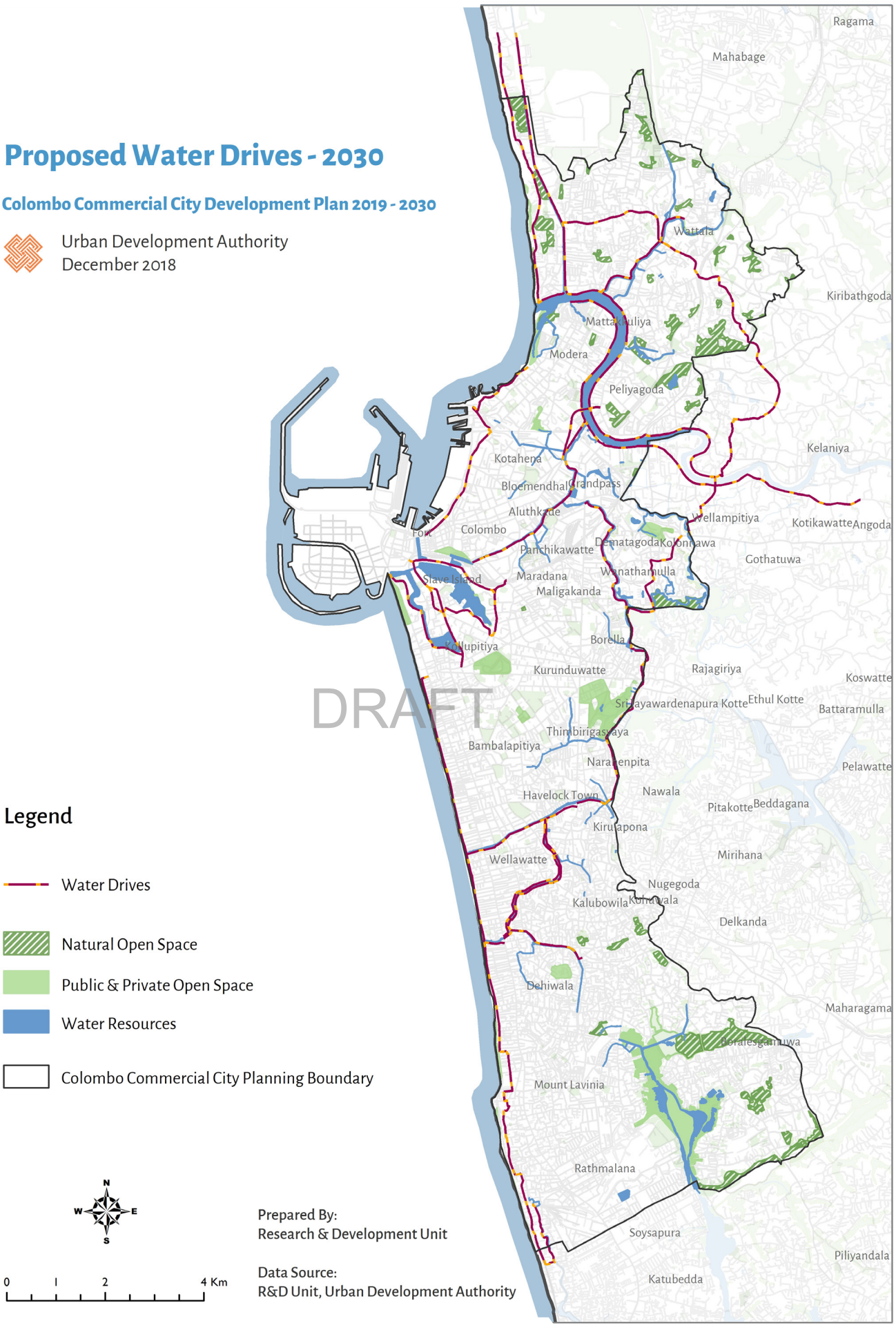

Legend

- Water Drives
- Natural Open Space
- Public & Private Open Space
- Water Resources
- Colombo Commercial City Planning Boundary

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Prepared By:
Research & Development Unit

Data Source:
R&D Unit, Urban Development Authority

Map 4.2: *Proposed Water Drives - 2030*

(b) Linear Parks (Project Code - WO-1)

Another major intervention to expose waterbodies is the development of linear parks parallel to rivers, canals and at the perimeter of lake. The purpose of linear parks is to provide more public access to waterfronts, avoid possible encroachments of river and canal reservations and to transform the waterfronts into front-yards of the city. On the other hand, linear parks will contribute to increase the total public open recreational space within the city. Approximately, 57.7 km length of linear parks are proposed along various waterfronts of different categories as mentioned in Map 4.3 (Page 48)

Figure 4.5: *Conceptual Images of Proposed Linear Parks*

The derived projects under this strategic action will be implemented parallel to the strategies identified under Public Outdoor Recreational Space Management Strategy. Hence, the project codes of linear park constriction projects will be aligned under Water Esplanade Development & PORS Management Strategies – Combined Action Projects Type 01 with the project code WO–1.

Water Esplanade	Name of the Linear Park	Respective Water Body/ wetland	Length of Linear Park	Project Code
Eminent – Marina Investment Esplanade	Preethipura Linear Park parallel to sea-front	Sea-front	4.5 km	WO–1-1
	Ratmalana Canal Linear Park	Sea-front & Ratmalana Canal	1.0 km	WO–1-2
Eminent – Kelani River Investment Esplanade	Kelani River Left & Right Bank Linear Parks	Kelani River	20.0 km	WO–1-3

Water Esplanade	Name of the Linear Park	Respective Water Body/ wetland	Length of Linear Park	Project Code
Eminent – Beira Lake Investment Circle	Linear Parks along the perimeter of Beira Lake	Beira Lake	10.2 km	WO–1-4
Classic – St. Sebestian Canal Investment Esplanade	St. Sebestian Canal Linear Park	St. Sebestian Canal	4.4 km	WO–1-5
Classic – Dematagoda, Kinda Canal & Kirulapana Canal Investment Esplanade	Kittampahuwa Canal Linear Park	Kittampa-huwa (Kolonnawa) Canal	5.3 km	WO–1-6
	Kirulapana Canal Linear Park	Kirulapana Canal (Wellawatta Canal)	2.5 km	WO–1-7
Trivial – Mudun Ela Investment Esplanade	Hunupitiya – Wattala Kalu Ela Linear Park	Kalu Ela	3.3 km	WO–1-8
	Mudun Ela Linear Park	Mudun Ela	2.1 km	WO–1-9
Trivial – Bolgoda Lake Investment Esplanade	Boralesgamuwa Linear Park	Borales-gamuwa Paddy Lands	4.4 km	WO–1-10

Table 4.6: *The list of proposed Linear Parks*

(c) Gateway Boulevards (Project Code - WO-2)

Promotion of Gateway Boulevards is another strategic intervention to expose water bodies and to provide direct access between main roads and water bodies. Gateway Boulevard is a road having trees at either side that connects a waterfront with a main road, node or a public place. The purpose of Gateway Boulevards is to maintain the continuity of walkways or drives towards waterfronts. In the meantime, Gateway Boulevards also contribute to the city green coverage, improve walkability of streets, enhance the livability standards and city image and contribute to improve air quality. Construction and promotion of Gateway Boulevards will be undertaken under Water Esplanade Development & PORS Management Strategies – Combined Action Projects Type - 02 with the base project code WO–2 as shown in Map 4.4.

Proposed Linear Parks - 2030

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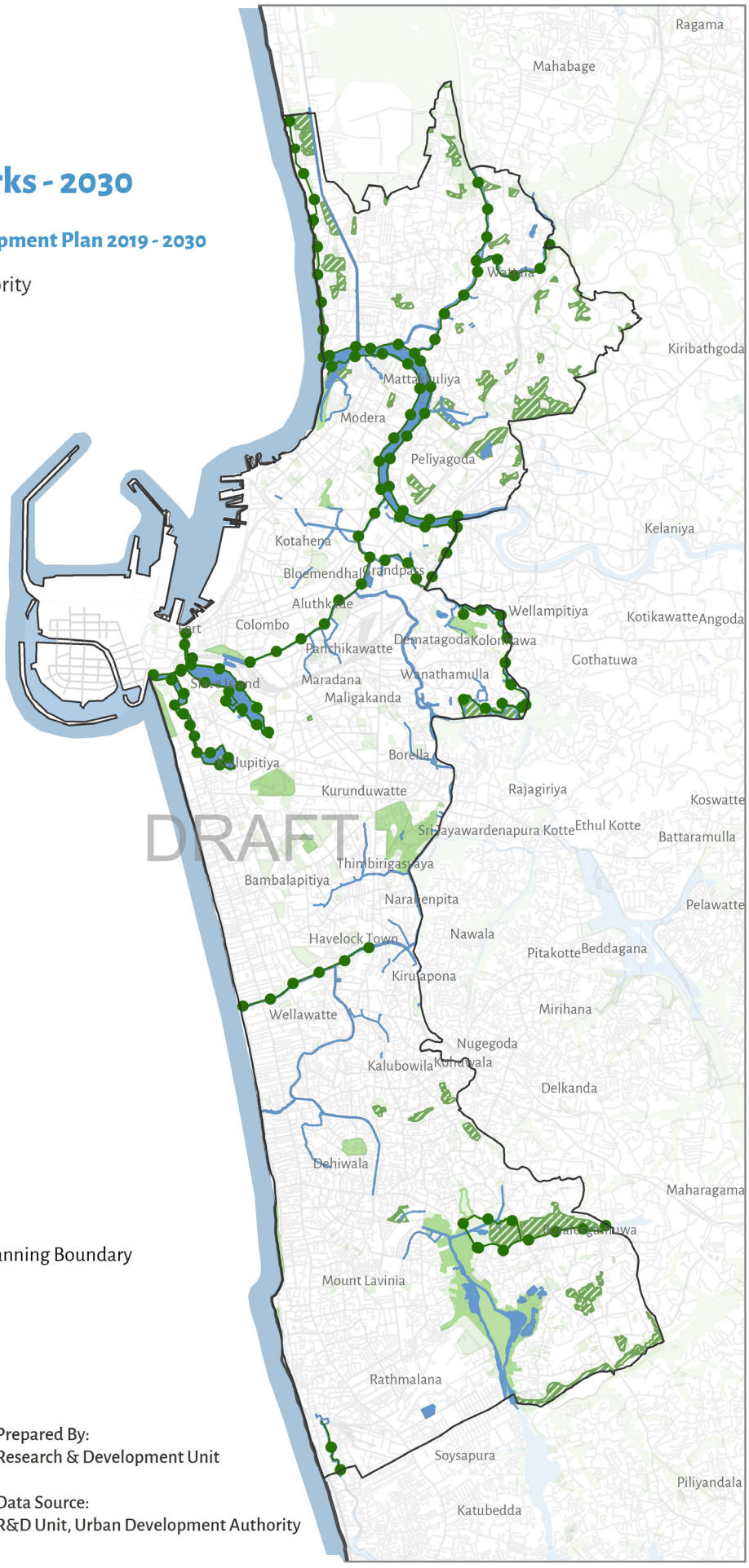

Legend

- Linear Park
- Natural Open Space
- Public & Private Open Space
- Water Resources
- Colombo Commercial City Planning Boundary

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Prepared By:
Research & Development Unit

Data Source:
R&D Unit, Urban Development Authority

Map 4.3: *Proposed Linear Parks - 2030*

Gateway Boulevard	Water Body/ Location	Length	Project Code
Kollupitiya Station Road	Seafront	0.14 km	WO-2-1
Bambalapitiya Station road	Seafront	0.23 km	WO-2-2
5th Lane, Bambalapitiya	Seafront	0.76 km	WO-2-3
Lester James Peries Mawatha	Seafront	0.75 km	WO-2-4
Vajira Road	Seafront	0.69 km	WO-2-5
St. Peter's Lane	Seafront	0.34 km	WO-2-6
Wellawatta Station Road	Seafront	0.37 km	WO-2-7
Wasala Road	Seafront	0.42 km	WO-2-8
Dehiwala Station Road	Seafront	0.41 km	WO-2-9
Hotel Road – Mount Lavinia	Seafront	1.16 km	WO-2-10
Mount Lavinia Station Road	Seafront	0.82	WO-2-11
Ratmalana Station Road	Seafront	1.33 km	WO-2-12
Sea Road – Crow Island	Seafront	2.20 km	WO-2-13
Justice Akbar Mawatha	Beira Lake	0.77 km	WO-2-14
Mattakkuliya Church Road	Kelani River	1.36 km	WO-2-15
Madampitiya Road	Kelani River	1.44 km	WO-2-16
Fransewatta Lane	Kelani River	0.52 km	WO-2-17
Pamankada Road	Dehiwala Canal	1.44 km	WO-2-18
Stratford Avenue	Dehiwala Canal	0.58 km	WO-2-19
Gajaba Road	Heen Ela	0.66 km	WO-2-20
Preethipura Road	Seafront & Hamilton canal	4.45 km	WO-2-21
Hekitta Road	Hamilton Canal	1.53 km	WO-2-22
Gongale Goda Banda Raja Mawatha	Kelani River	1.16 km	WO-2-23
Meegahawatta Road	Peliyagoda Water Fountain	0.55 km	WO-2-24
Dutugemunu Mawatha	Peliyagoda Water Fountain	0.87 km	WO-2-25
Parakrama Lane	Peliyagoda Water Fountain	0.18 km	WO-2-26
4th Cross Lane	Peliyagoda Water Fountain	0.35 km	WO-2-27
Ananda Rajakaruna Mawatha	Demtagoda Canal	0.72 km	WO-2-28

Strategic Interventions to activate Water Esplanade

Exposing the existing water network by introducing water drives, linear parks and gateway boulevards

Gateway Boulevard	Water Body/ Location	Length	Project Code
Sri Nigrodharama Road	Demtagoda Canal	0.67 km	WO-2-29
Vijaya Road	Kolonnawa Marsh, Kittampahuwa Canal	1.30 km	WO-2-30

****NOTE – WO-2 refers to Water Esplanade Development & PORS Management Strategies – Combined Action Projects Type - 02**

Table 4.7: *The list of proposed Gateway Boulevards*

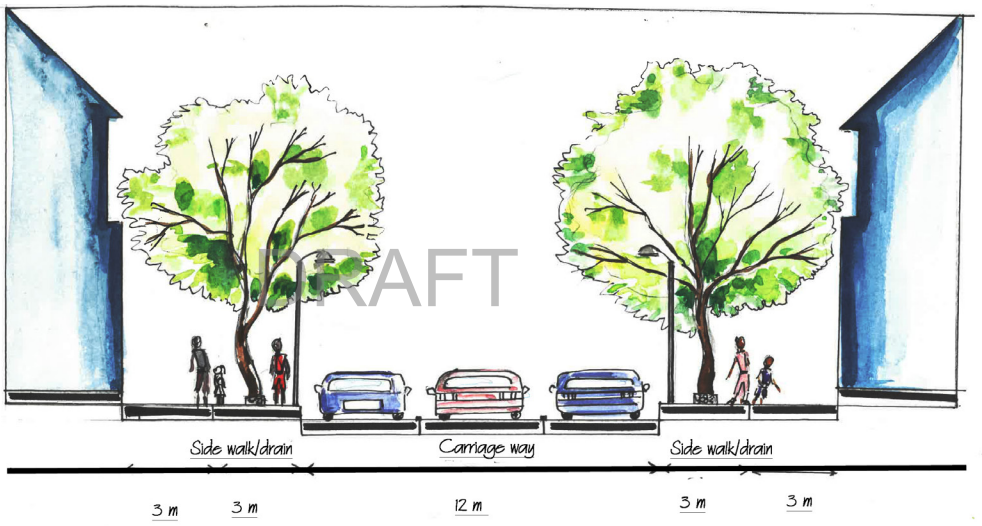

Figure 4.6: *A Cross-section of Proposed Gateway Boulevard connecting Kollupitiya Station and Galle Road*

Figure 4.7: *Conceptual Images of Proposed Gateway Boulevards*

Proposed Gateway Boulevards 2030

Colombo Commercial City Development Plan 2019 - 2030

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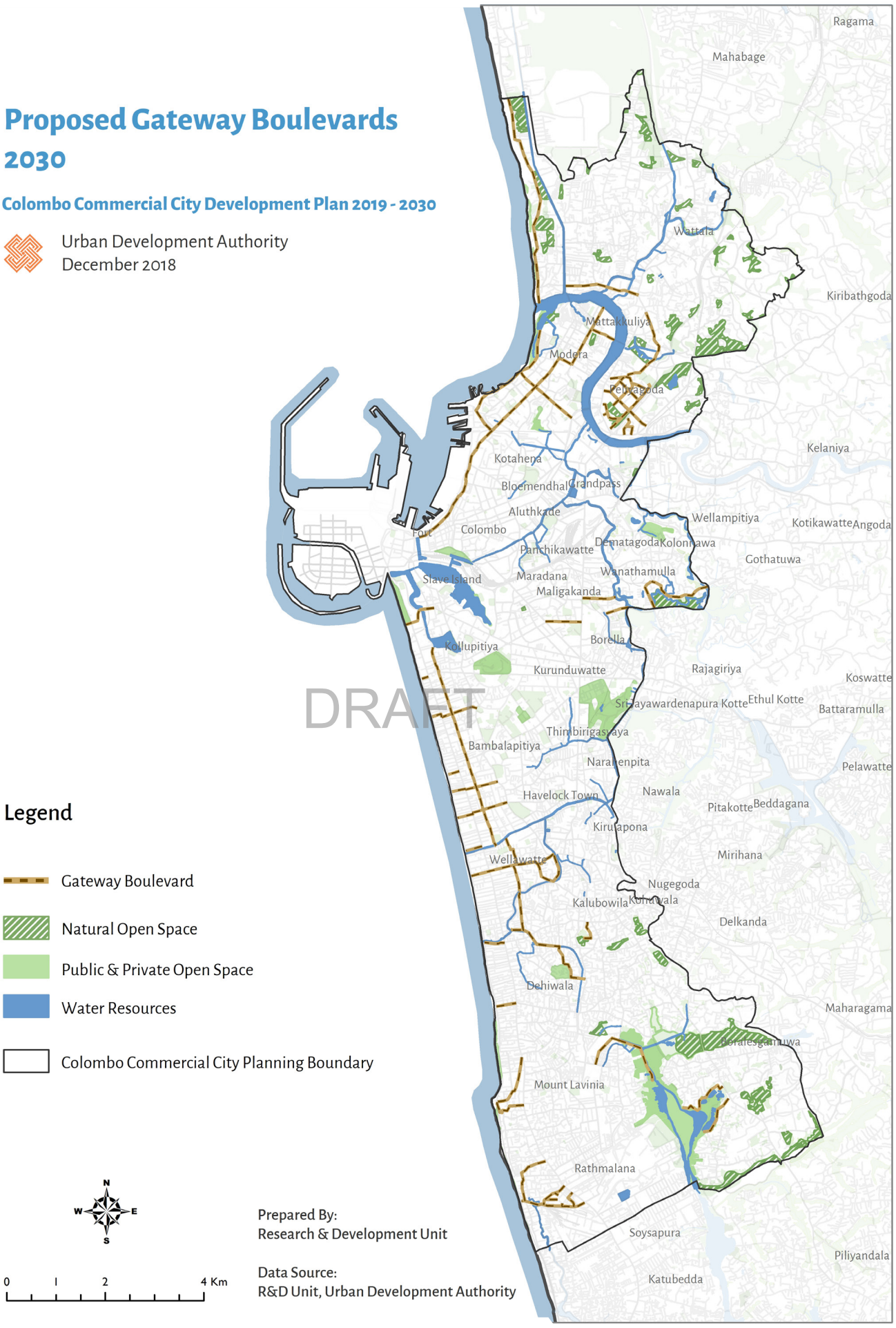

Legend

- Gateway Boulevard
- Natural Open Space
- Public & Private Open Space
- Water Resources
- Colombo Commercial City Planning Boundary

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Prepared By:
Research & Development Unit

Data Source:
R&D Unit, Urban Development Authority

Map 4.4: *Proposed Gateway Boulevards - 2030*

4.2.4. Incorporating storm water management projects conducted by relevant stakeholder agencies (Project Code - W-2)

In the situational analysis, it was identified that flash floods is one of the burdening issues of *Colombo Commercial City* with a considerable significance where an average rainfall with the intensity of 50mm to 100mm per day results in flash flood that lasts for about 1 to 2 hours. As identified by the Risk Analysis conducted by relevant stakeholder agencies, the flood risk is relatively higher in Kelani River banks and canal surrounding areas. The floods in *Colombo Commercial City* occur mainly due to two reasons; overflow of Kelani River and flash floods due to deficiencies of existing storm water drainage network.

When leading the city towards its future vision 'Aquarina – The City in Water', it is important to make certain that *Colombo Commercial City* is free of flood risks. It is important to follow necessary flood mitigation methods and adopt a sound storm water management strategy parallel to the proposed waterfront developments. Hence, the compatible flood mitigation and storm water management projects proposed by relevant stakeholder agencies are incorporated in to the *Colombo Commercial City Development Plan – 2019-2030* under the project code W-2.

(a) Incorporating ongoing & proposed interventions for Macro Drainage Network by SLLRDC (Project Code - W-2-1)

The projects proposed by Sri Lanka Land Reclamation & Development Corporation (SLLRDC) as indicated in Table 4.8 and Figure 4.8 (Page 54) are incorporated into the *Colombo Commercial City Development Plan – 2019-2030* under the project code W-2-1.

No.	SLLRDC Sub-project No.	Sub-project
Completed		
1	W/01	Dehiwala Canal
2	W/02	Main Drain, Aluth Mw Culvert, Mutwal Outfall
3	W/03/A	St. Sebastian South Canal
4		Dredging of Thalangama Tank
5	W/07/A	Wellawatte Canal
Ongoing		
6	W/05	Improvements to Madiwela East Diversion Scheme – Stage I
7	W/11	Improvements to Madiwela East Diversion Scheme – Stage II

No.	SLLRDC Sub-project No.	Sub-project
8	W/19	Improvements to Madiwela East Diversion Scheme – Stage III
9	W/09	St. Sebastian North Canal
10	W/12	St. Sebastian North Lock Gates & Pumping Station
Procurement Stage		
11	W/14	New Mutwal Tunnel & Torrington Tunnel
12	W/16/B	Kolonnawa Canal Diversion Scheme – Stage II
13	W/13	St. Sebastian South Pumping Station
14	W/24	Ambathale Pumping Station
Finalizing / Detailed Design Stage		
15	W/16/A	Kolonnawa Canal Diversion Scheme – Stage I
16	W/16/C	Kolonnawa Canal Diversion Scheme – Stage III
17	W/16/D	Kolonnawa Canal Diversion Scheme – Stage IV
18	W/18	Real Time Control System
19	W/20	Flushing Gates

Table 4.8: *Proposed Interventions for Macro Drainage Network of Colombo by SLLRDC*

(b) Incorporating proposed interventions for storm water drainage network by CMC (Project Code - W-2-2)

Following proposals of *Colombo Municipal Council* proposed with the intention of mitigating flash flood risk within City of Colombo are incorporated into the *Colombo Commercial City Development Plan – 2019-2030* under the Project Code W-2-2 (Figure 4.9, Page 55).

1. Prevention of flooding at Garden No. 175 and No. 211 Nagalagam Street and Garden No. 75 Ferguson Road
2. Prevention of flooding along K. Cyril C. Perera Mw from George R. De Silva Mw up to Arthur De Silva Mw. Junction
3. Prevention of flooding at Kimbula Ela Housing Scheme
4. Prevention of flooding at Sangaraja Mawatha, Prince of Wales Avenue; opposite to Diesel and Motor Engineering (PLC)
5. Prevention of flooding at Green Lane, George R de Silva Mawatha and Rathnam Play Ground Area
6. Prevention of flooding at Saunders Place
7. Prevention of flooding at Maligawatta Housing Scheme
8. Prevention of flooding at Norris Canal

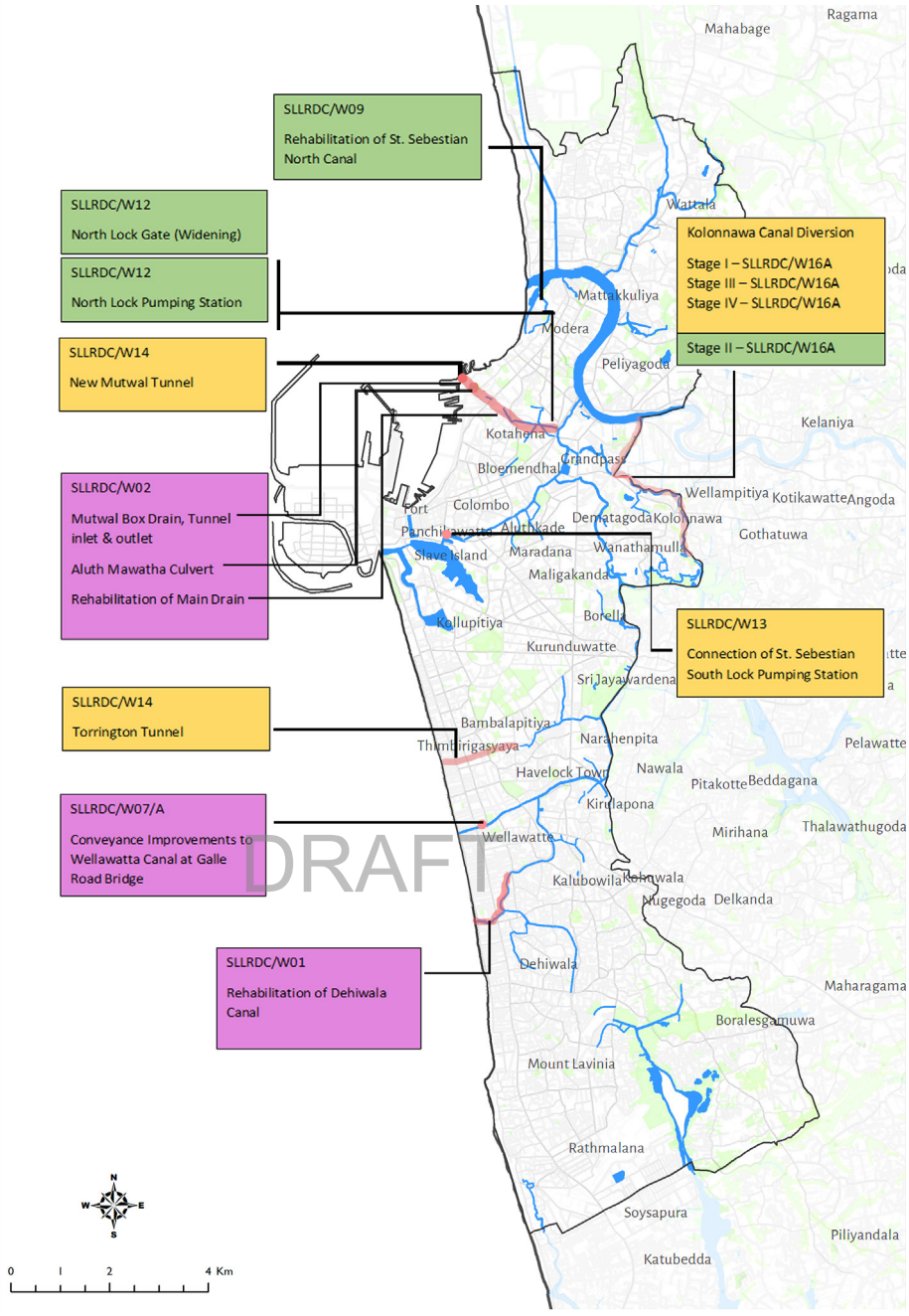


Figure 4.8: *Proposed Interventions for Macro Drainage Network of Colombo by SLLRDC*

9. Storm Water improvements of Siridhamma Mawatha and surrounding area
10. Prevention of flooding at High level road, Kirullapone Junction and Robert Gunewardhana Mawatha
11. Prevention of flooding at Poorvarama Road and Kandewaththa Road
12. Prevention of flooding at Park Road
13. Periperal drains arount Thummulla Junction
14. Balance part of Marine Drive development from Dehiwala Bridge up to Bambalapitiya Station Road

Strategic Interventions to activate Water Esplanade

Incorporating storm water management projects conducted by relevant stakeholder agencies

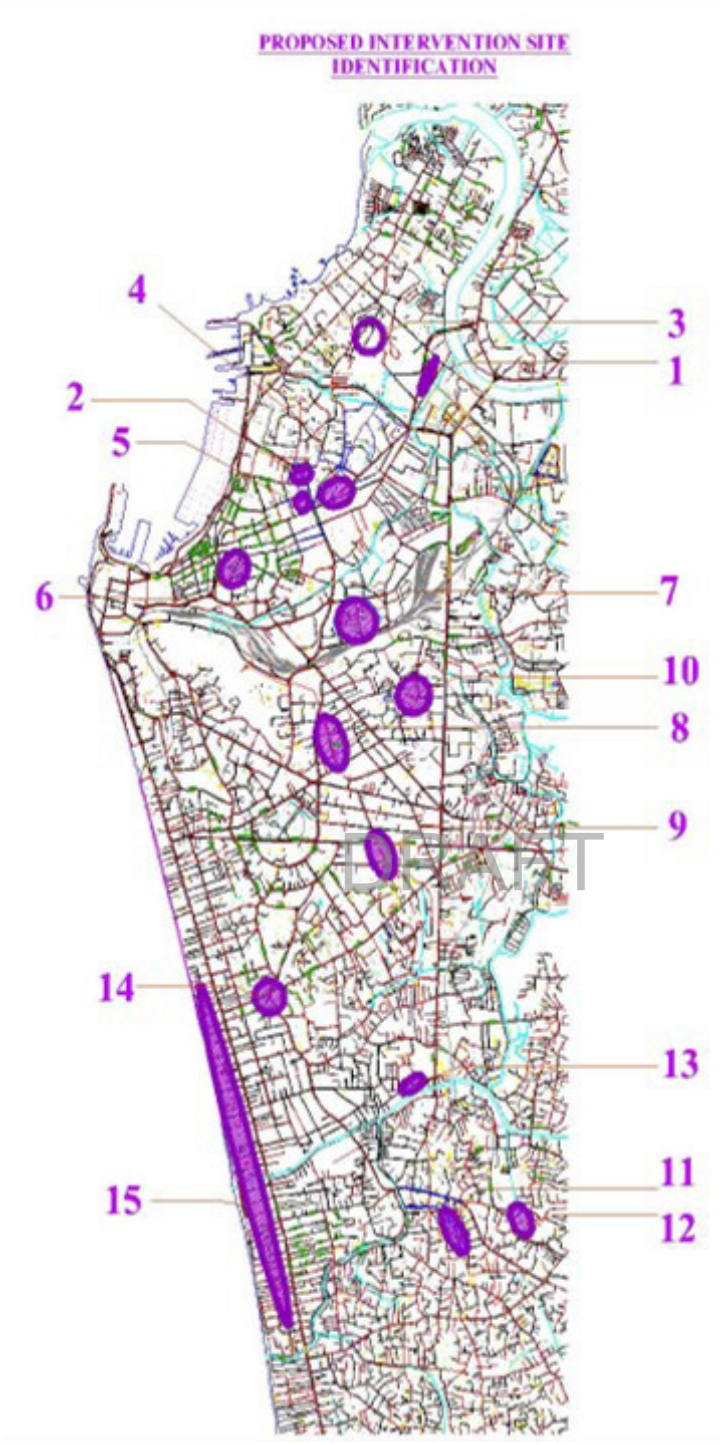


Figure 4.9: *Proposed Interventions for Storm Water Drainage Network by Colombo Municipal Council*

(c) Incorporating Lower Kelani Flood Mitigation Proposals of Climate Resilience Project (CRIP) (Project Code – W–2–3)

Even though Kelani River is proposed to be promoted as a major water esplanade that attracts investments to the area, there is a considerable flood risk due to the overflow of river during high rainfall events. If these flood risks are not controlled, the anticipated development at the Kelani river Investment Esplanade would not be achieved. Hence, mitigation of floods at Kelani River surroundings is considered as a mandatory requirement.

As per the Lower Kelani Flood Mitigation Proposals by CRIP, it is proposed to construct retaining walls at the left and right banks of Kelani River. It is proposed to incorporate these proposals into the *Colombo Commercial City Development Plan – 2019-2030* under the project code W-2-3, given the condition that these are well aligned and integrated with the proposals of **CCCDP**.

4.2.5. Maintaining adequate surface water level of all inland water bodies of Colombo Commercial City (Project Code - W-3)

In order to achieve the city vision 'Aquarina – The City in Water', it is important to ensure that all water bodies have sufficient surface water level during all seasons without being dried. In order to fulfill this requirement, it is proposed to draw required engineering solutions in consultation with relevant stakeholder agencies and incorporate them in to the *Colombo Commercial City Development Plan – 2019-2030* under the project code W-3.

4.2.6. Conducting Catalyst Projects to induce developments in the proposed Water Esplanades (Project Code - W-4)

Various catalyst projects will be conducted at each water esplanade to induce envisaged developments and the expected physical and social transformation. These catalyst projects will fall under different categories such as road improvements, linear parks, visibility enhancements, landscaping, walkability improvements, public and open space development and property developments etc.

All identified Catalyst Projects of each Water Esplanade will be aligned under Water Esplanade Development Strategy – Action Projects Type - 02 with the project code W-4.

Major Level (Eminent) Water Esplanades

a) Catalyst Projects at Marina Investment Esplanade (Project Code: W-4-1)

- *Recreational Stretch (Project Code: W-4-1-1)*

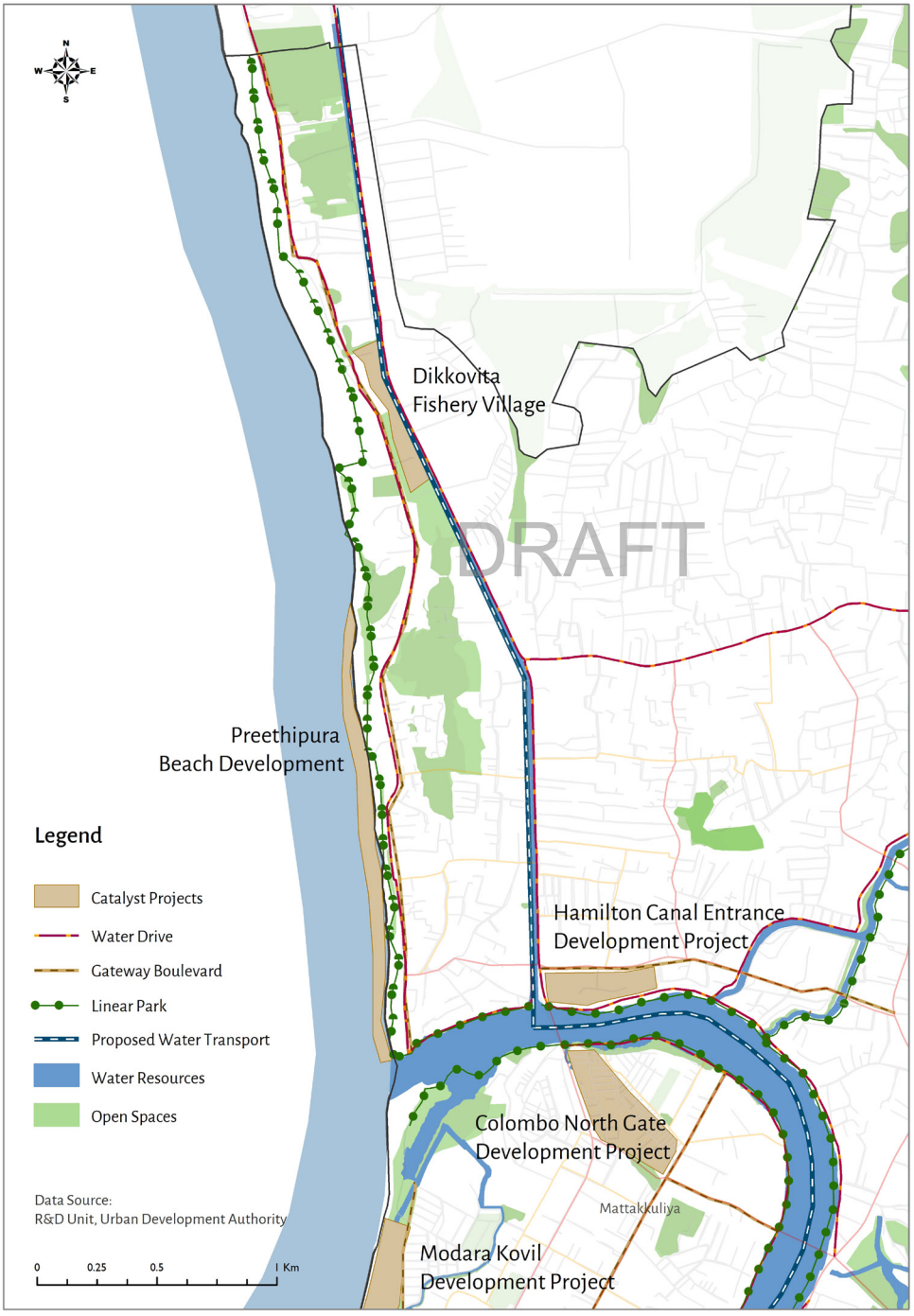


Figure 4.10: *Proposed Catalyst Projects at the Recreational Stretch of Marina Investment Esplanade*

No.	Project Name	Project Code
01	Incorporating the proposals of Tourism & Livelihood Development Plan: Hamilton Canal and Its Environs (2011) by the Ministry of Economic Development.	W-4-1-1-1
01-a	Promoting a tourism fishery village at Dikkovita	W-4-1-1-1-a
01-b	Developing a linear park along the beach from Kerawalapitiya to Kelani River Mouth at Mattakkuliya	W-4-1-1-1-b
01-c	Promoting Preethipiura Beach for Recreational Activities	W-4-1-1-1-c
01-d	Hamilton Canal Entrance Development Project	W-4-1-1-1-d
02	Promoting water recreational and pleasure activities at Kelani River Mouth, Sea-front and Hamilton Canal Entrance Area	W-4-1-1-2

Table 4.9: *Proposed Catalyst Projects at the Recreational Stretch of Marina Investment Esplanade*

- *Cultural Stretch (Project Code: W-4-1-2)*

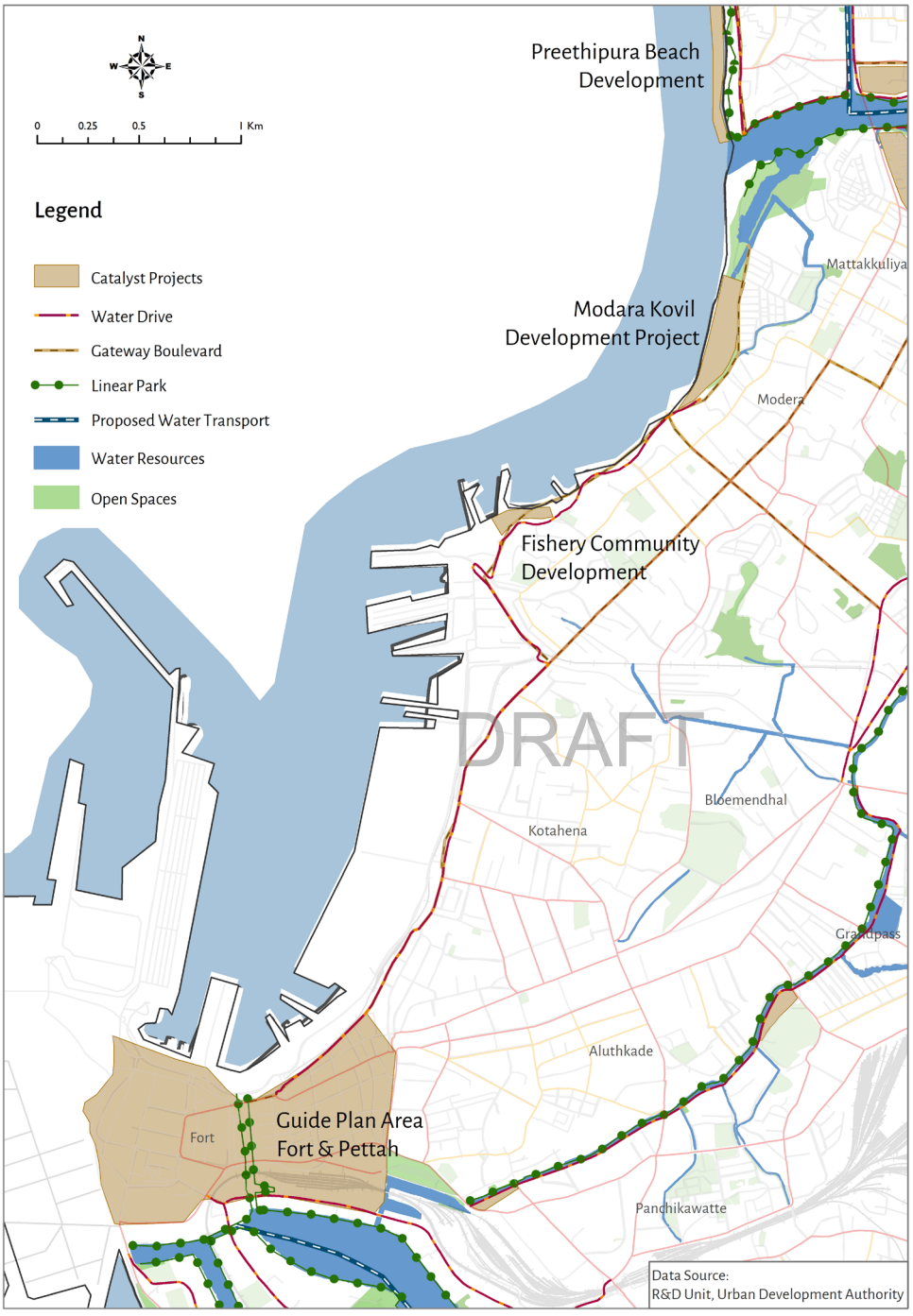


Figure 4.11: *Proposed Catalyst Projects at the Cultural Stretch of Marina Investment Esplanade*

No.	Project Name	Project Code
01	Enhancing the view of Colombo Port and Seafront along the edge of Colombo Port at Sea Street for an approximate length of 2.6 km.	W-4-1-2-1
02	Implementing a special Guide Plan for the Pettah Bazaar Area in order to conserve the archeologically important buildings and the special character associated with its daily functioning pattern.	W-4-1-2-2
03	Upgrading fishery community settlements along the coast with the application of 'Slum Architecture' design approach. (Approx. 1 ha area of intervention)	W-4-1-2-3
04	Incorporating the Crow Island Beach Park Project conducted by Metro Colombo Urban development Project in collaboration with Colombo Municipal Council.	W-4-1-2-4
05	Construction of a continuous walkable path (approx. 4.7 km) connecting Crow Island and Pettah Bazaar.	W-4-1-2-5
06	Incorporating ongoing Modara Kovil Sacred Area Development Project proposed by Urban Development Authority.	W-4-1-2-6
07	Promoting Sea Street as an Eminent Water Drive which extends for an approx. length of 4.7 km.	WT-2-3 *Previous Reference: Table 4.5

Table 4.10: *Proposed Catalyst Projects at the Cultural Stretch of Marina Investment Esplanade*

- *Premium Investment Stretch (Project Code: W-4-1-3)*

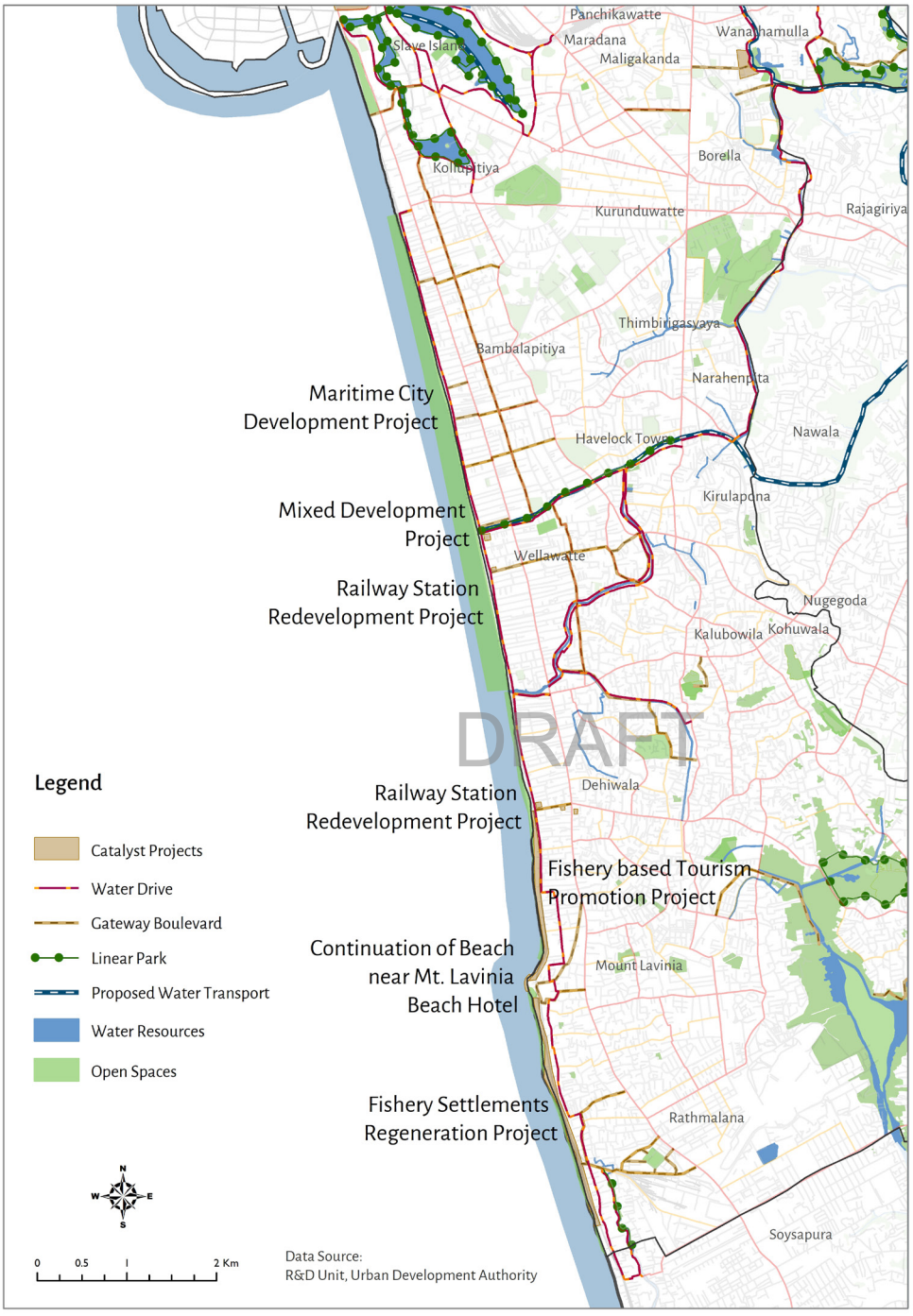


Figure 4.12: *Proposed Catalyst Projects at the Premium Investments Stretch of Marina Investment Esplanade*

No.	Project Name	Project Code
01	Promoting Colombo Plan Road (Marine Drive) as a Functional Street	W-4-1-3-1
01-a	Extension of Colombo Plan Road up to Dehiwala Railway Station (approx. 1.2 km of new road link)	WT-2-4 *(Previous reference – WT projects – Table: 4.5)
01-b	Construction of a physical barrier at the either side of southern railway line to ensure safety of public	W-4-1-3-1-b
01-c	Incorporating the proposal by Colombo Port City Project to connect Colombo Plan Road and Port City with an underground road link	W-4-1-3-1-c
02	Incorporating Maritime City Development Project proposed by Ministry of Megapolis & Western Development which includes; Beach nourishment from Galle Face Green to Dehiwala & Construction of Multistoried Mixed Development Buildings at each Railway Station at Southern Railway Line	W-4-1-3-2
03	Promoting the beach strip from Dehiwala Railway Station to Mount-lavinia including the section of underserved settlements (fishery industry based community settlement) for fisheries based tourism activities with application of the design concept of 'slum architecture'	W-4-1-3-3
04	Ensuring the continuity of beach allowing public access across the Mount Lavinia Beach Hotel. (Connecting the either sides of Beach discontinued by the Mount Lavinia Beach Hotel)	W-4-1-3-4
05	Upgrading the lives and settlements of Fishery Based Communities living in underserved settlements at the beach strip from Mount-lavinia to Ratmalana (Application of the design approach 'Slum Architecture and interlinking with tourism activities)	W-4-1-3-5

Table 4.11: *Proposed Catalyst Projects at the Premium Investments Stretch of Marina Investment Esplanade*

(b) Catalyst Projects at Kelani River Investment Esplanade (Project Code: W-4-2)

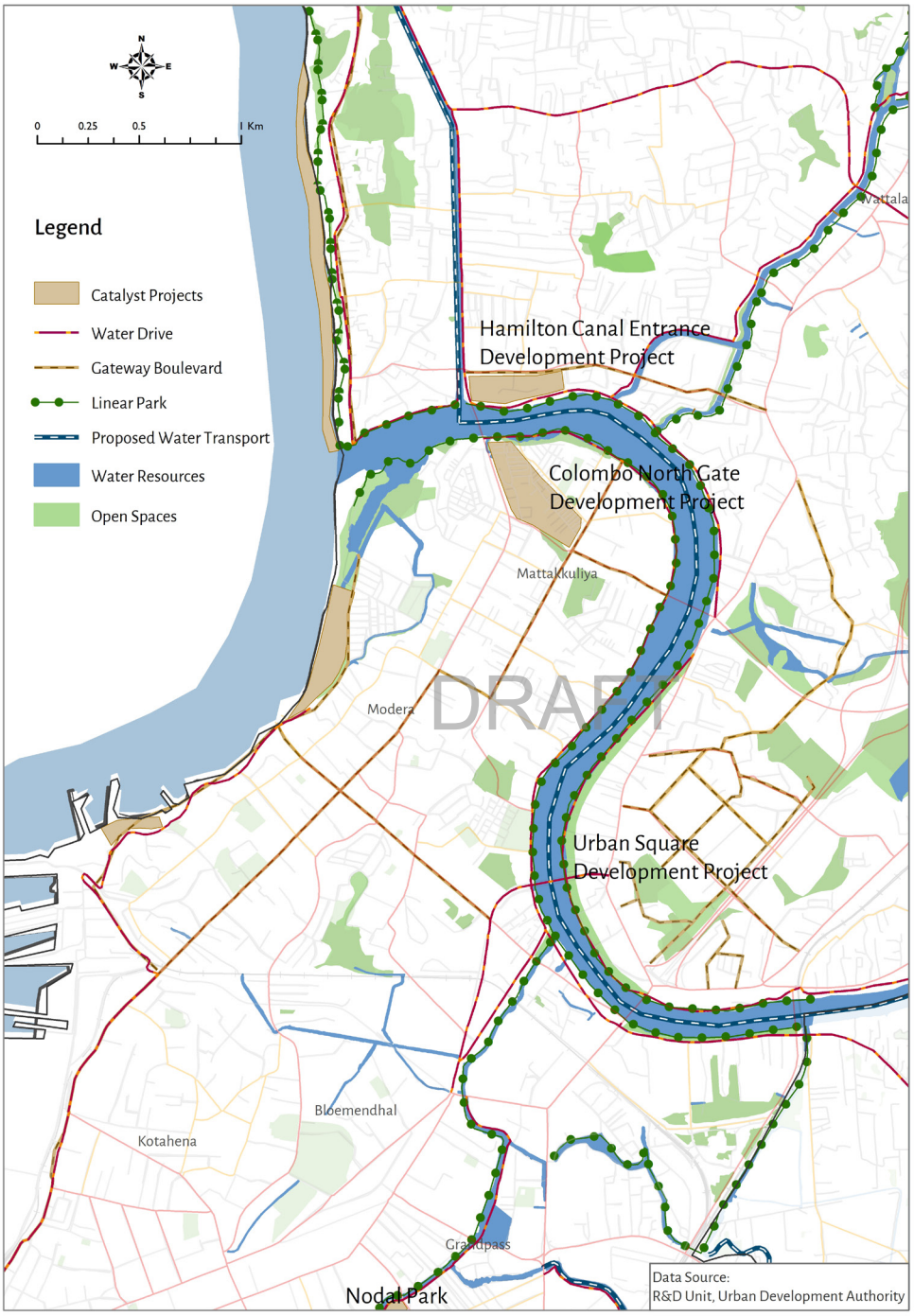


Figure 4.13: *Proposed Catalyst Projects at the Kelani River Investment Esplanade*

No.	Project Name	Project Code
01	Construction of two roads at left & right banks of Kelani River (road type 01 – a & 01 – b consequently) and promoting them as Eminent Water Drives	Left Bank Road - WT-1-1 Right Bank Road - WT-2-1 *(Previous reference – WT projects – Table: 4.5)
02	Develop two linear parks at left & right banks of Kelani River from Mattakkuliya to Peliyagoda	WO–1-3 *(Previous reference – WO projects – Table: 4.6)
03	Colombo North Gate Development Project	W-4-2-1
04	Incorporating the proposals of Tourism & Livelihood Development Plan: Hamilton Canal and its Environs (2011) proposed by the Ministry of Economic Development	W-4-2-2
05	Peliyagoda Multi Modal Transport Hub Development	T-4-1-2-1 *(Following reference – Table: 6.7)
06	Promoting Water Transportation links along Kelani River as Tourism Recreational Activities (Cruise Service) and Passenger Transportation	W-4-2-3

Table 4.12: *Proposed Catalyst Projects at the Kelani River Investment Esplanade*

(c) Catalyst Projects at Beira Lake Investment Circle (Project Code: W-4-3)

No.	Project Name	Project Code
01	Incorporating Beira Lake Intervention Area Development Plan proposed & implemented by Urban Development Authority	W-4-3-1
02	Continuation of the Linear Park encircling entire Beira Lake Area	W-4-3-2

Table 4.13: *Proposed Catalyst Projects at the Beira Lake Investment Circle*

(d) Catalyst Projects at St. Sebestian Canal Investment Esplanade (Project Code: W-4-4)

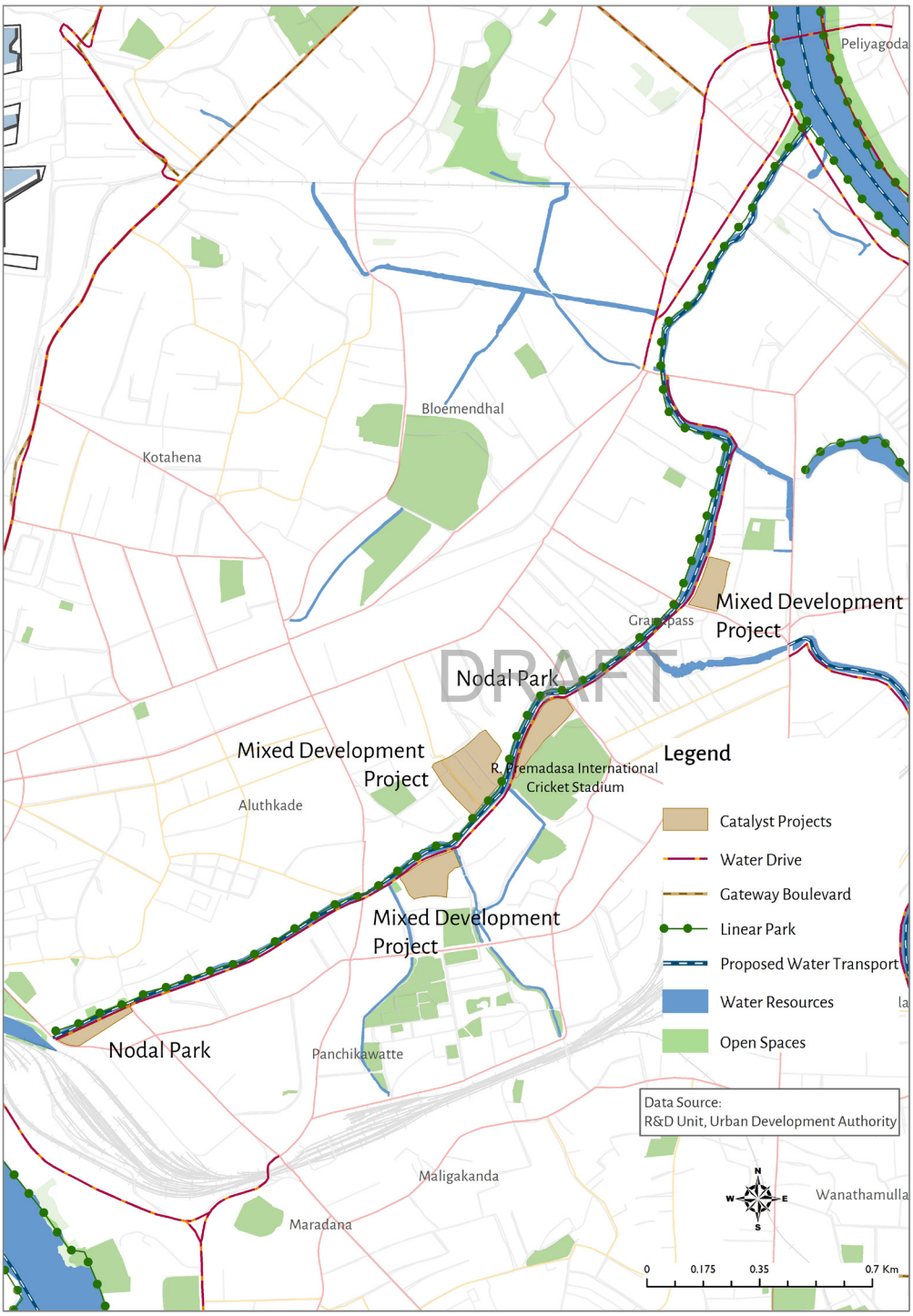


Figure 4.14: *Proposed Catalyst Projects at the St. Sebestian Canal Investment Esplanade*

No.	Project Name	Project Code
01	Development of a Linear Park along the left bank of St. Sebestian Canal from Pettah to Peliyagoda (approx. length of 3.6 km)	WO–1-5 *(Previous reference – WO projects – Table: 4.6)
02	Construction of a Level 01-b road along St. Sebestian Road and promote it as a Classic Water Drive	WT-2-5 *(Previous reference – WT projects – Table: 4.5)
03	Development of two Nodal Parks at St. Sebestian Canal Investment Esplanade	W-4-4-1 *(Following reference – O projects – Table:)
03-a	Development of Nodal Park in between Sanchiarachchi Garden Road and St. Sebestian Canal (approx. area of 0.7 ha)	W-4-4-1-a
03-b	Development of Nodal Park next to Kettaramaya Maha Viharaya Temple (approx. area of 1.35 ha)	W-4-4-1-b
04	Implementing a special Guide Plan for Judiciary Square	W-4-4-2 *(Following reference -Table: 6.6)
05	Clearing of existing Underserved Settlements in the Reservation and surroundings of St. Sebestian Canal and open up them for Mixed Developments	W-4-4-3
06	Upgrading the surroundings of R. Premadasa International Cricket Stadium	W-4-4-4
07	Promotion of a Cruise Service linking Beira Lake and Kelani River	W-4-4-5
08	Reconstruction of cross bridges along the St. Sebestian Canal as to facilitate boat and cruise transportation	W-4-4-6

Table 4.14: *Proposed Catalyst Projects at the St. Sebestian Canal Investment Esplanade*

(e) Catalyst Projects at Dematagoda, Kinda Canal & Kirulapana Canal Investment Esplanade (Project Code: W-4-5)

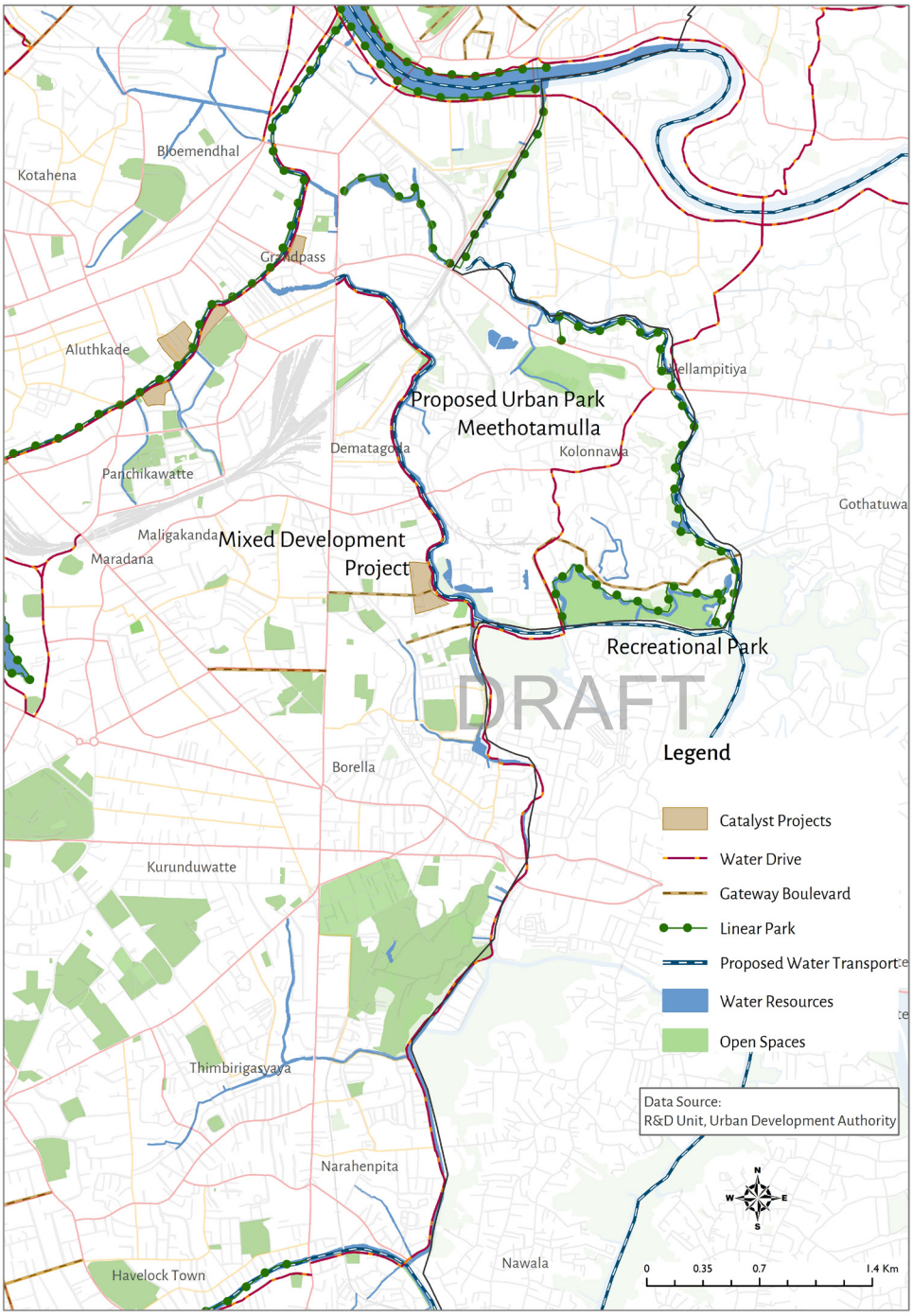


Figure 4.15: *Proposed Catalyst Projects at the Dematagoda, Kinda Canal & Kirulapana Canal Investment Esplanade*

No.	Project Name	Project Code
01	Extension of Lake Drive (Level 01 –a road type) along Kinda, Heen Ela, and Kittampahuwa Canal (Kolonnawa Canal)	WT-1-3 *(Previous reference – WT Projects – Table: 4.5)
02	Construction of Level 01 – a type road along Dematagoda Canal and promoting it as a Classic Water Drive	WT-1-4 *(Previous reference – WT Projects – Table: 4.5)
03	Development of an Urban Park at the existing Meethotamulla Waste Dumping Site (approx. extent of 7.1 ha)	W-4-5-1 *(Following reference – O projects – Table:)
04	Development of a Recreational Park at Kolonnawa Marsh (approx. extent of 18.5 ha)	W-4-5-2 *(Following reference – O projects – Table:)
05	Constructing a Linear Park along Kittampahuwa Canal to connect Kolonnawa Marsh Recreational Park and Meethotamulla Urban Park (approx. length of 3.2 km)	WO–1-6 *(Previous reference – WO projects – Table: 4.6)
06	Conducting a Mixed Development Project at Sri Nigrodharama Mawatha Slums Area (approx. extent of 3 ha)	W-4-5-2
07	Promotion of Gate way boulevard at Ananda Rajakaruna Mawatha & Sri Negraodarama Mawatha connecting Hospital Square and Dematagoda Canal	WO-2-28 & WO-2-29 *(Previous reference – Table 4.7: The list of proposed Gateway Boulevards
08	Promotion of Gate way boulevard at Vijaya Road along the Kolonnawa Marsh connecting Extended Lake Drive and Kittampahuwa Linear Park	WO-2-30 *(Previous reference: Table 4.7)

Table 4.15: *Proposed Catalyst Projects at the Dematagoda, Kinda Canal & Kirulapana Canal Investment Esplanade*

(f) Catalyst Projects at Wellawatta & Dehiwala Canal Investment Esplanade (Project Code: W-4-6)

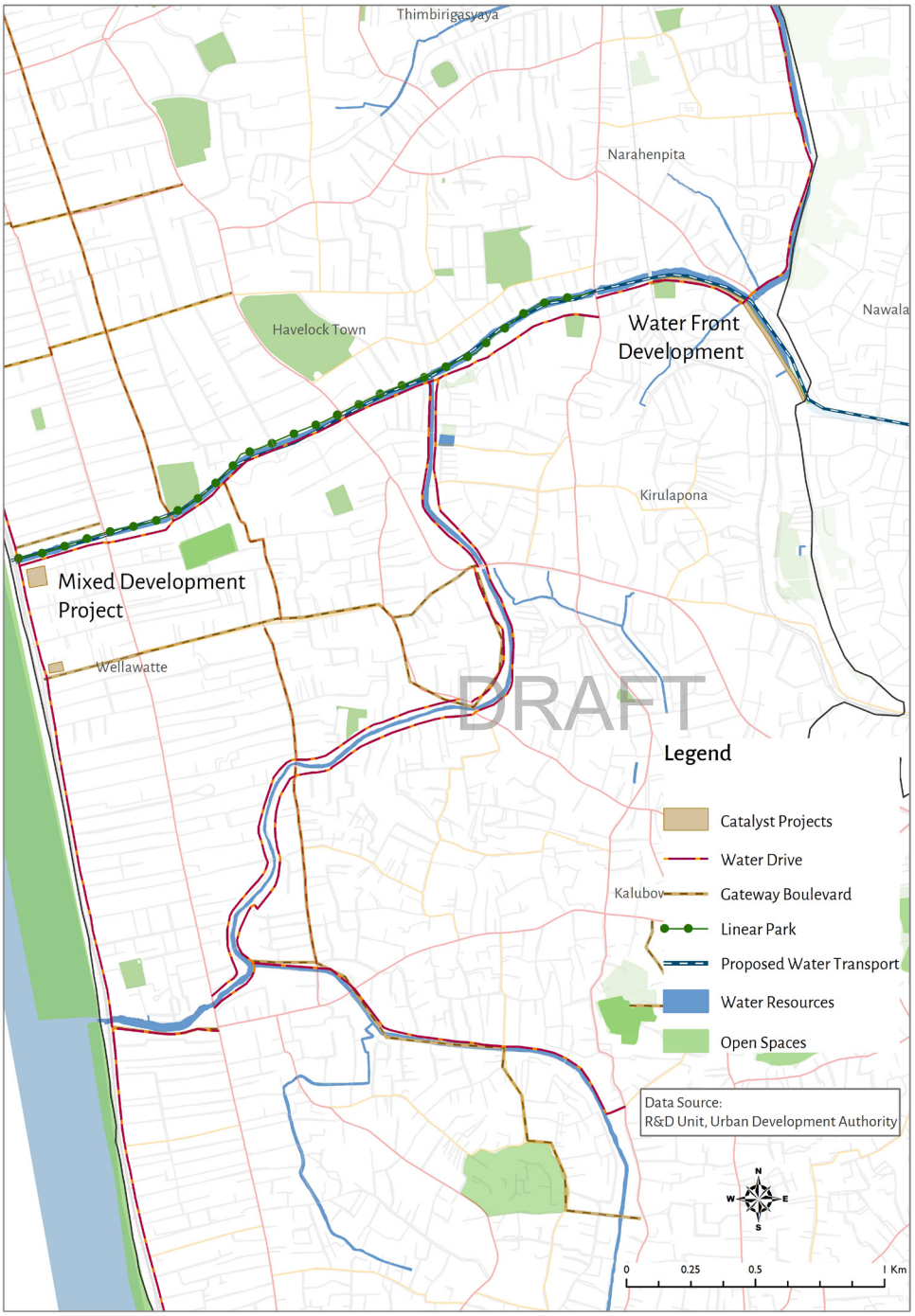


Figure 4.16: *Proposed Catalyst Projects at the Wellawatta & Dehiwala Canal Investment Esplanade*

No.	Project Name	Project Code
01	Construction of Level 01 –a road along Wellwatta Canal and promote it as a Classic Water Drive	WT-1-3 *(Previous reference – WT Projects – Table: 4.5 & 4.15)
02	Connecting missing links of the existing road along the either side of Dehiwala Canal (approx. length of missing links is 1.3 km and average width is 12 m)	WT-1-5 *(Previous reference – WT Projects – Table: 4.5)
03	Development of a Linear Park along Wellawatta Canal (approx. length of 3 km)	WO–1-7 **(Previous reference – WO Projects – Table: 4.6)
04	Development of an Open Public Space adjacent to Open University of Sri Lanka at Nawala managed by the University. (approx. length of 1 km)	W-4-6-1
05	Incorporating the existing proposal to initiate water transportation from Wellawatta to Battaramulla via Wellawatta, Kirulapana & Kinda Canals.	W-4-6-2
06	Promotion of a Mixed-Use Development along with the proposed Water Transportation Hub at Wellawatta adjoining Wellawatta Canal and Marine Drive	W-4-6-3

Table 4.16: *Proposed Catalyst Projects at the Wellawatta & Dehiwala Canal Investment Esplanade*

(g) Catalyst Projects at Mudun Ela Investment Esplanade (Project Code: W-4-7)

No.	Project Name	Project Code
01	Construction of Level 01 – a road along Mudun Ela and promoting it as a Classic Water Drive (approx. length of 2.2 km)	WT-1-7 *(Previous reference – WT Projects – Table: 4.5)
02	Construction of two Linear Paths at the either sides of Mudun Ela by continuing the existing walking path. (approx. length of 3.3 km)	WO-1-8 *(Previous reference – WO Projects – Table: 4.6)
03	Construction of three pedestrian bridges to link either sides of Mudun Ela	W-4-7-1

Table 4.17: *Proposed Catalyst Projects at the Mudun Ela Investment Esplanade*

(h) Catalyst Projects at Bolgoda Lake Investment Esplanade (Project Code: W-4-8)

No.	Project Name	Project Code
01	Constructing a Linear Park connecting Weras Ganga Recreational Park and Borelesgamuwa Lake Recreational Area (approx. length of 1.6 km)	WO-1-10 *(Previous Reference: Table 4.6)
02	Promoting a Wetland Recreational Area at the Attidiya Bird Sanctuary area and Nedimala Canal Area	W-4-8-1 *(Following reference – O projects – Tbale 6.13 & ....)

Table 4.18: *Proposed Catalyst Projects at the Bolgoda Lake Investment Esplanade*

Strategic Interventions to activate Water Esplanade

Conducting Catalyst Projects to induce developments in the proposed Water Esplanades

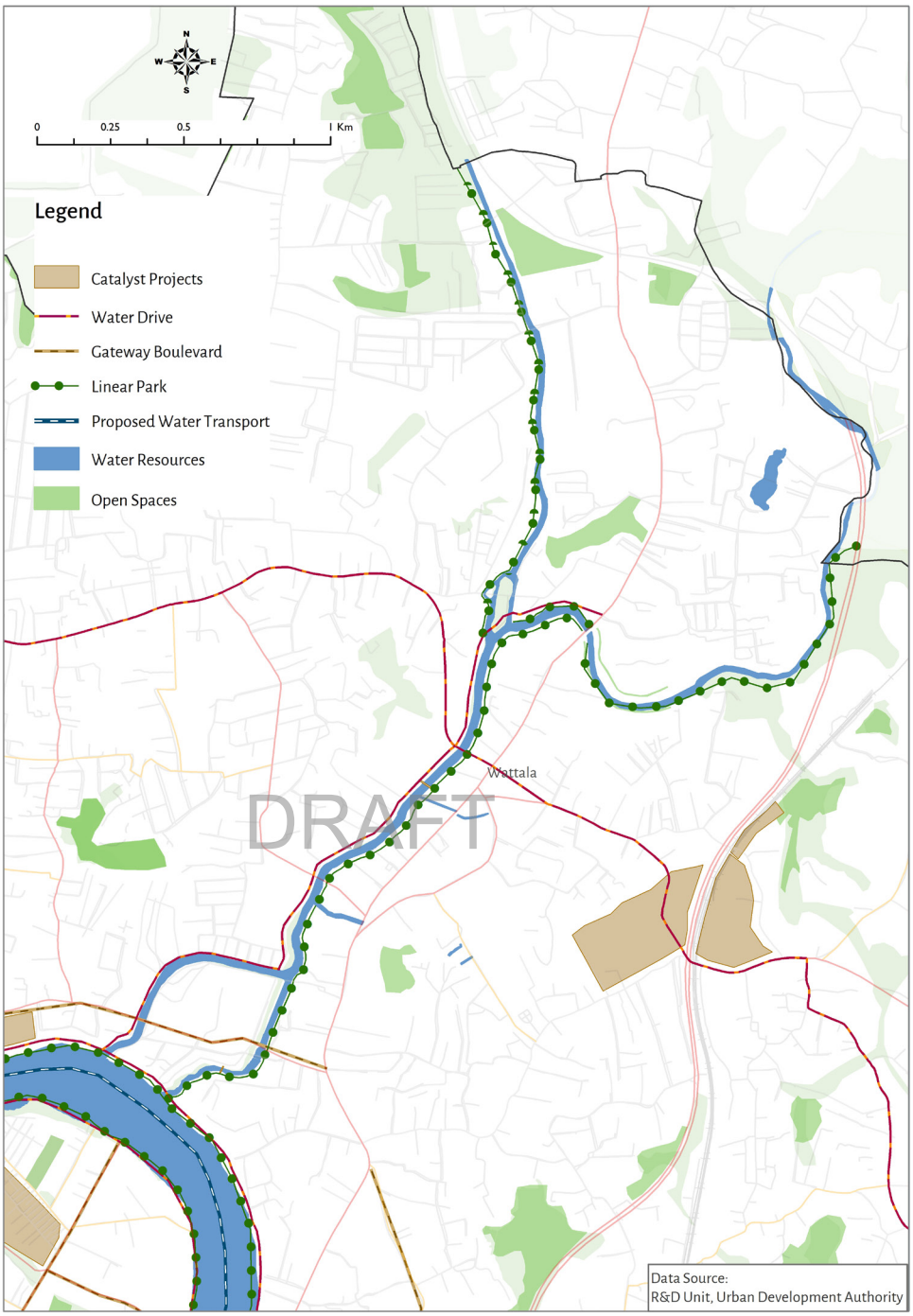


Figure 4.17: *Proposed Catalyst Projects at the Mudun Ela Investment Esplanade*

Strategic Interventions to activate Water Esplanade

Conducting Catalyst Projects to induce developments in the proposed Water Esplanades

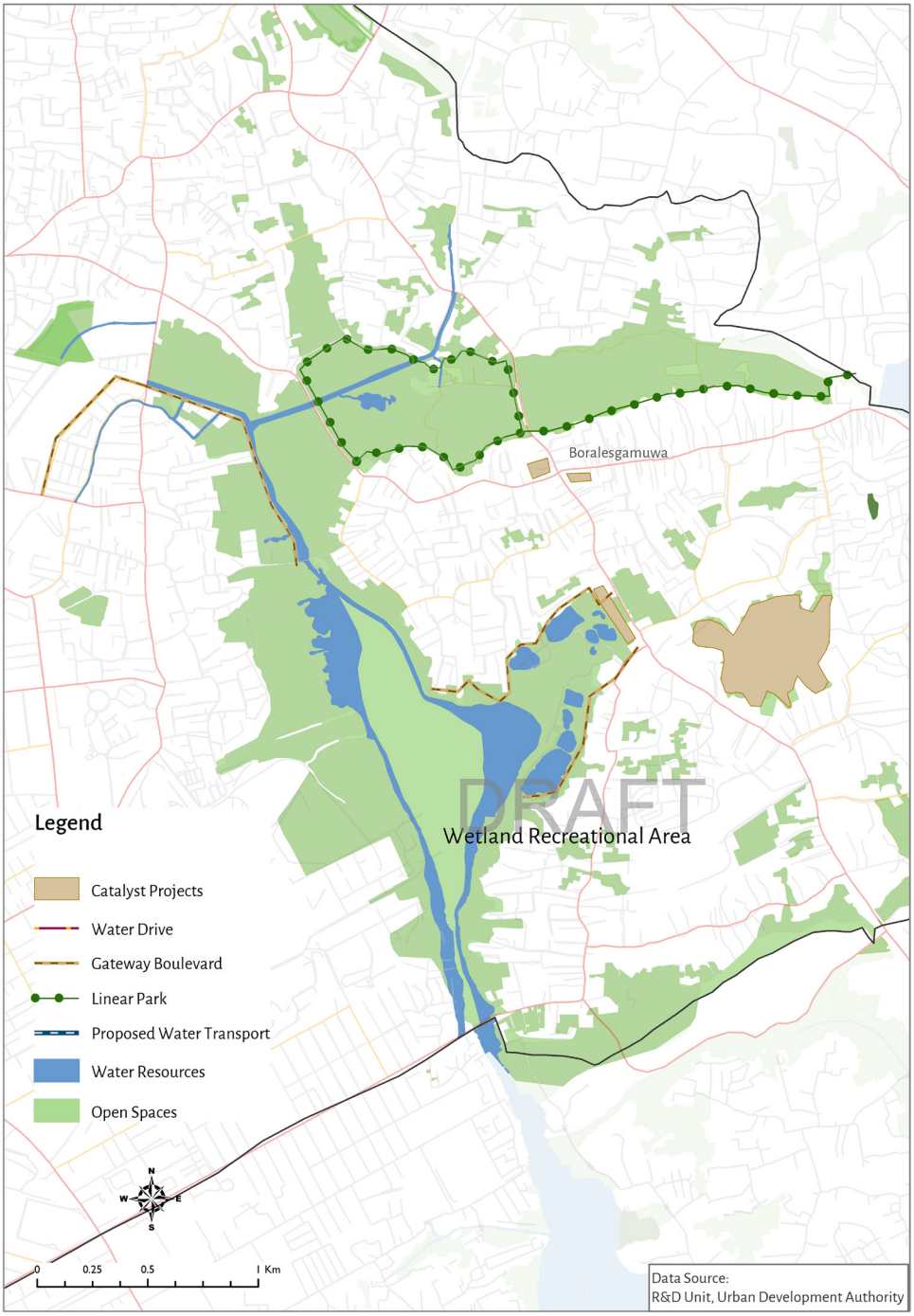
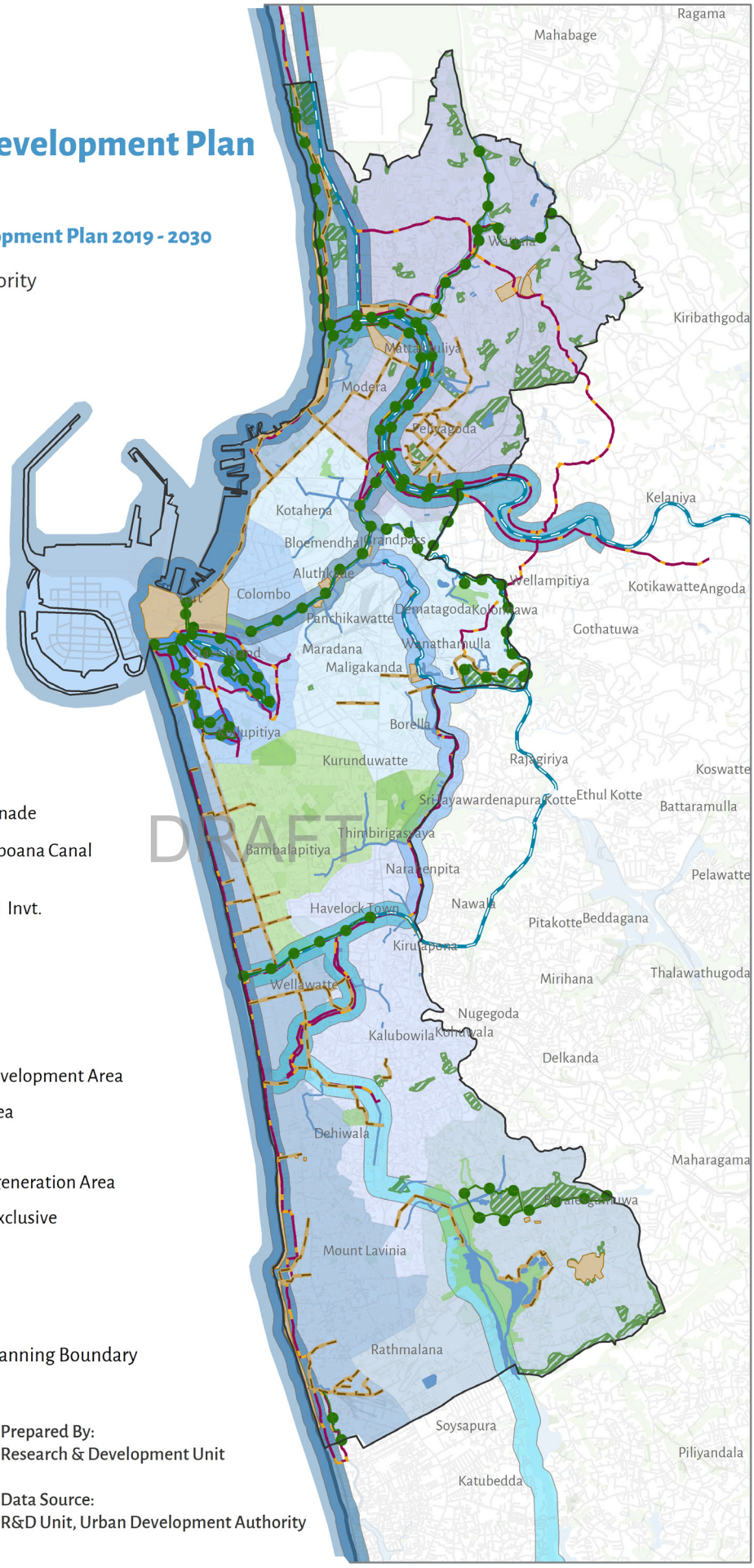


Figure 4.18: *Proposed Catalyst Projects at the Bolgoda Lake Investment Esplanade*

Water Esplanade Development Plan 2030

Colombo Commercial City Development Plan 2019 - 2030

Urban Development Authority
December 2018



Legend

- Proposed Projects
- Water Drives
- Linear Park
- Gateway Boulevard
- Proposed Water Transport

Water Esplanades

- Marina Invt. Esplanade
- Kelani River Invt. Esplanade
- Beira Lake Invt. Circle
- St. Sebastian Canal Invt. Esplanade
- Dematagoda, Kinda and Kirulpoana Canal Invt. Esplanade
- Wellawatta & Dehiwala Canal Invt. Esplanade
- Mudun Ela Invt. Esplanade
- Bolgoda Lake Invt. Area

Aqua Regions

- Bolgoda River based Green Development Area
- Canal Base Transformation area
- Canal Base Development area
- Kelani River based Special Regeneration Area
- Beira Lake & Port City based Exclusive Development Area
- The Marina Corridor
- The Garden

- Colombo Commercial City Planning Boundary

N W E S

0 1 2 4 Km

Prepared By:
Research & Development Unit

Data Source:
R&D Unit, Urban Development Authority

Map 4.5: *Water Esplanade Development Strategy – Composite Map*

4.3. Future Possible Impacts of Water Esplanade Development Strategies

4.3.1. Enhanced Exposure of Lands due to Waterfront Developments

As a result of the above strategic interventions, it was estimated that around 123.57 km of various waterfronts will be exposed in the means of 86km of water drives, 57km of linear parks and 23.15km of Gateway Boulevards. Around 51km of waterfronts will be exposed linked with Public Open Spaces such as linear parks, pocket parks and other wetland and waterfront parks. Altogether, the total extent of waterfront based lands that will be exposed due to above strategic actions will be approx. 3330 ha. Currently, only around 7% of total lands (approx. 470 ha) of *Colombo Commercial City* are exposed with waterfront developments. However, estimations revealed that this 7% will be increased up to 47% resulting a 40% of total land area having new exposure with proposed waterfront developments.

As per the estimations, it was further revealed that approximately 750 ha of lands located in 50 m buffer zone of exposed waterfronts will have direct impacts while around 2600 ha of lands located in 250 m buffer will have neighbouring impacts (Map 4.6 – Page 76 and Map 4.7 – Page 77)

4.3.2. Increased Land Values due to Waterfront Developments

The future possible increase in land values due to waterfront developments and enhanced exposure of lands was estimated based on an international research article 'Price Variation in Waterfront Properties Over the Economic Cycle' authored by Randy E. Dumm & William T. Hold of Florida State University. As per the research article, the approximate increases in land values that can be expected as a result of waterfront developments related to different types of water bodies are as follows.

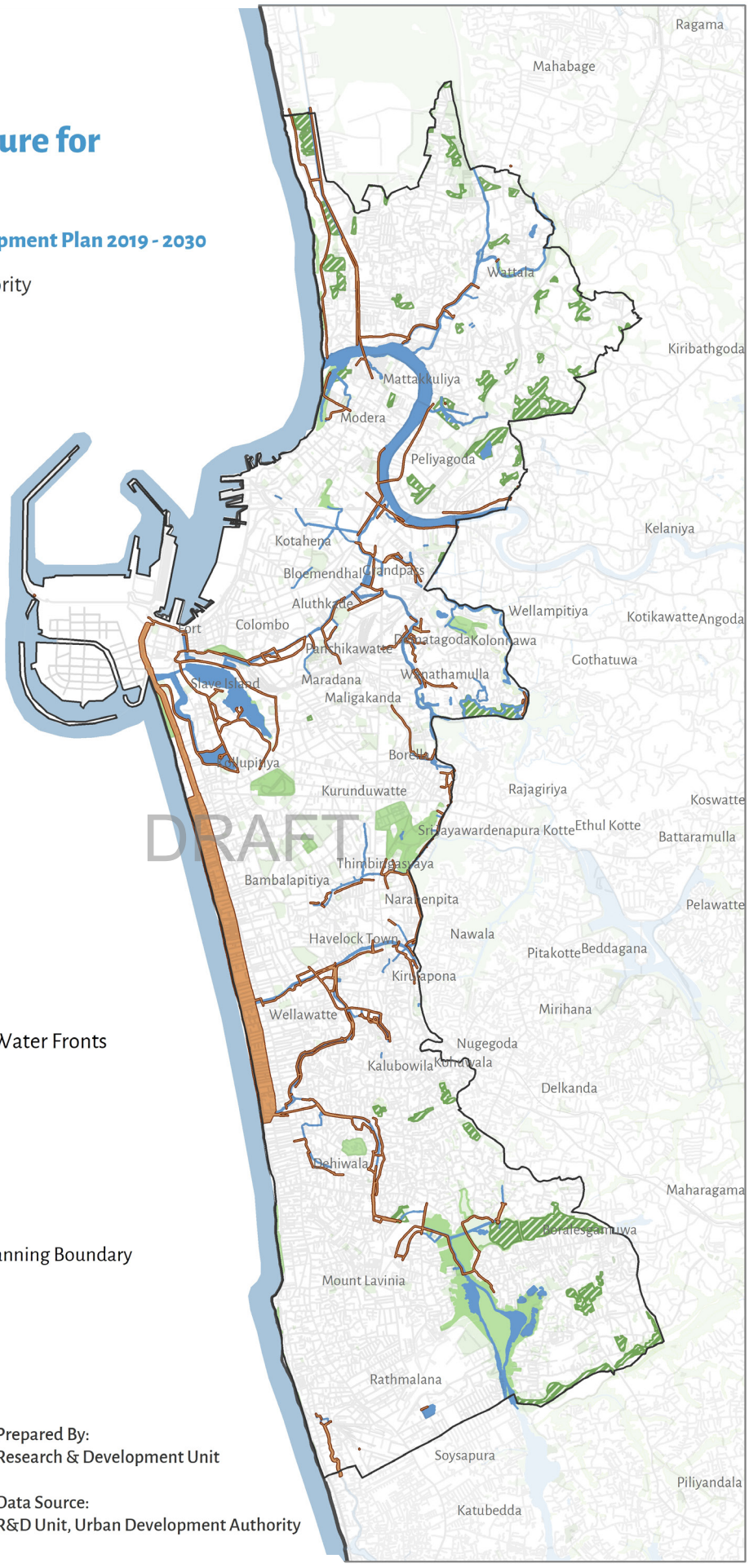
- **Riverfronts – 62%**
- **Canal fronts – 61%**
- **Lake fronts – 15%**
- **Ponds – 3.1%**
- **Sea front – 21% to 28%**

Accordingly, the future land values of *Colombo Commercial City* were forecasted based on above theoretical factors and compared with the existing land values. (Map 4.8 – Page 78 and Map 4.9 – Page 79)

Existing Land Exposure for Water Fronts - 2018

Colombo Commercial City Development Plan 2019 - 2030

Urban Development Authority
December 2018



Legend

- Existing Lands exposed to Water Fronts
- Natural Open Space
- Public & Private Open Space
- Water Resources
- Colombo Commercial City Planning Boundary

N
W E
S

0 1 2 4 Km

Prepared By:
Research & Development Unit

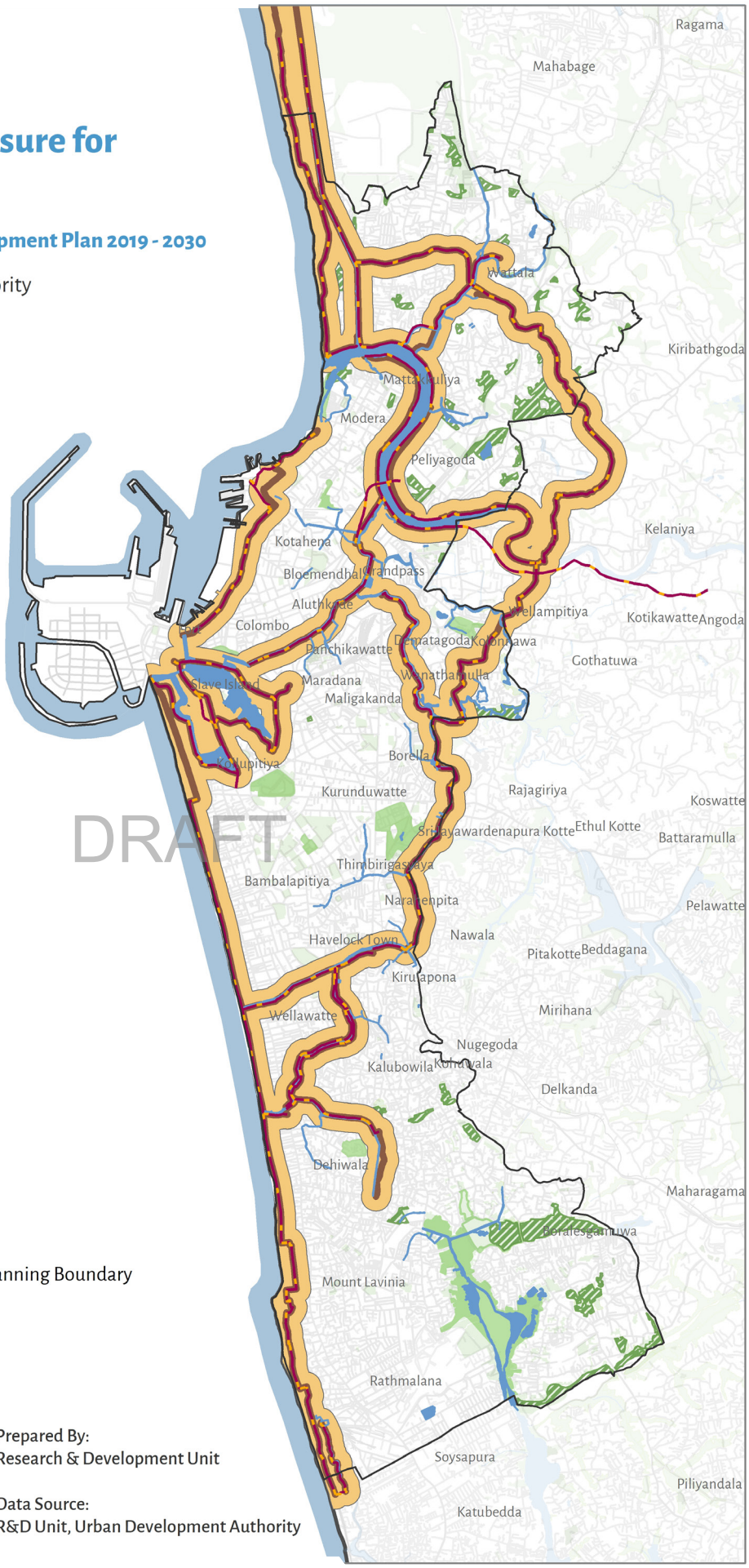
Data Source:
R&D Unit, Urban Development Authority

Map 4.6: *Existing lands exposed to waterfronts - 2018*

Expected Land Exposure for Water Fronts - 2030

Colombo Commercial City Development Plan 2019 - 2030

Urban Development Authority
December 2018



Legend

- Water Drives
- 50m Area
- 250m Area
- Natural Open Space
- Public & Private Open Space
- Water Resources
- Colombo Commercial City Planning Boundary

N
W E
S

0 1 2 4 Km

Prepared By:
Research & Development Unit

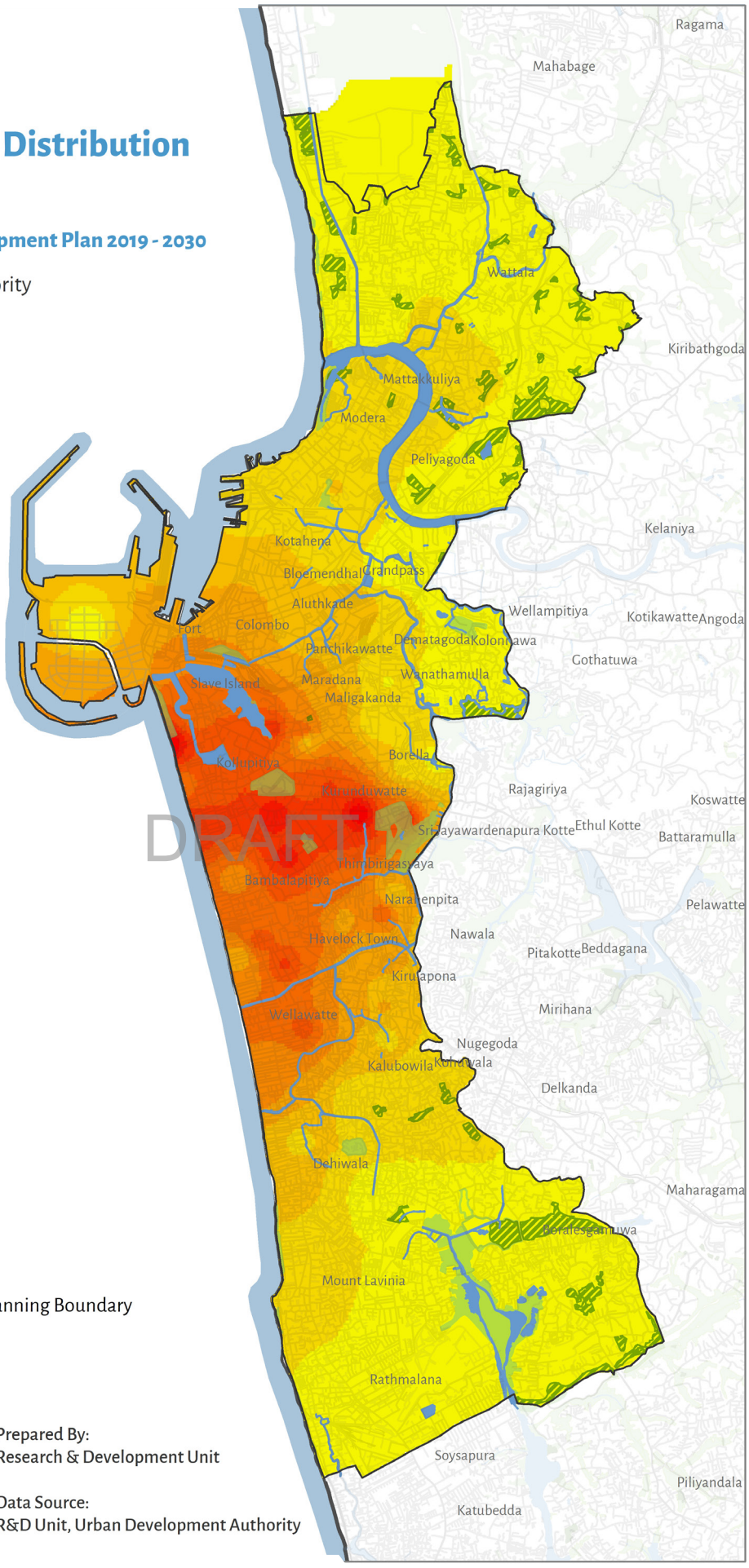
Data Source:
R&D Unit, Urban Development Authority

Map 4.7: *Future Lands that will be exposed to Water fronts - 2030*

Existing Land Value Distribution 2018

Colombo Commercial City Development Plan 2019 - 2030

Urban Development Authority
December 2018



Legend

Land Value (LKR)

- <2,000,000
- 2,000,000.001 - 4,000,000
- 4,000,000.001 - 6,000,000
- 6,000,000.001 - 8,500,000
- 8,500,000.001 - 10,500,000
- 10,500,000.01 - 12,500,000
- 12,500,000.01 - 14,500,000
- 14,500,000.01 - 16,500,000
- 16,500,000.01 - 18,500,000
- 18,500,000.01<

Colombo Commercial City Planning Boundary

N W E S

0 1 2 4 Km

Prepared By:
Research & Development Unit

Data Source:
R&D Unit, Urban Development Authority

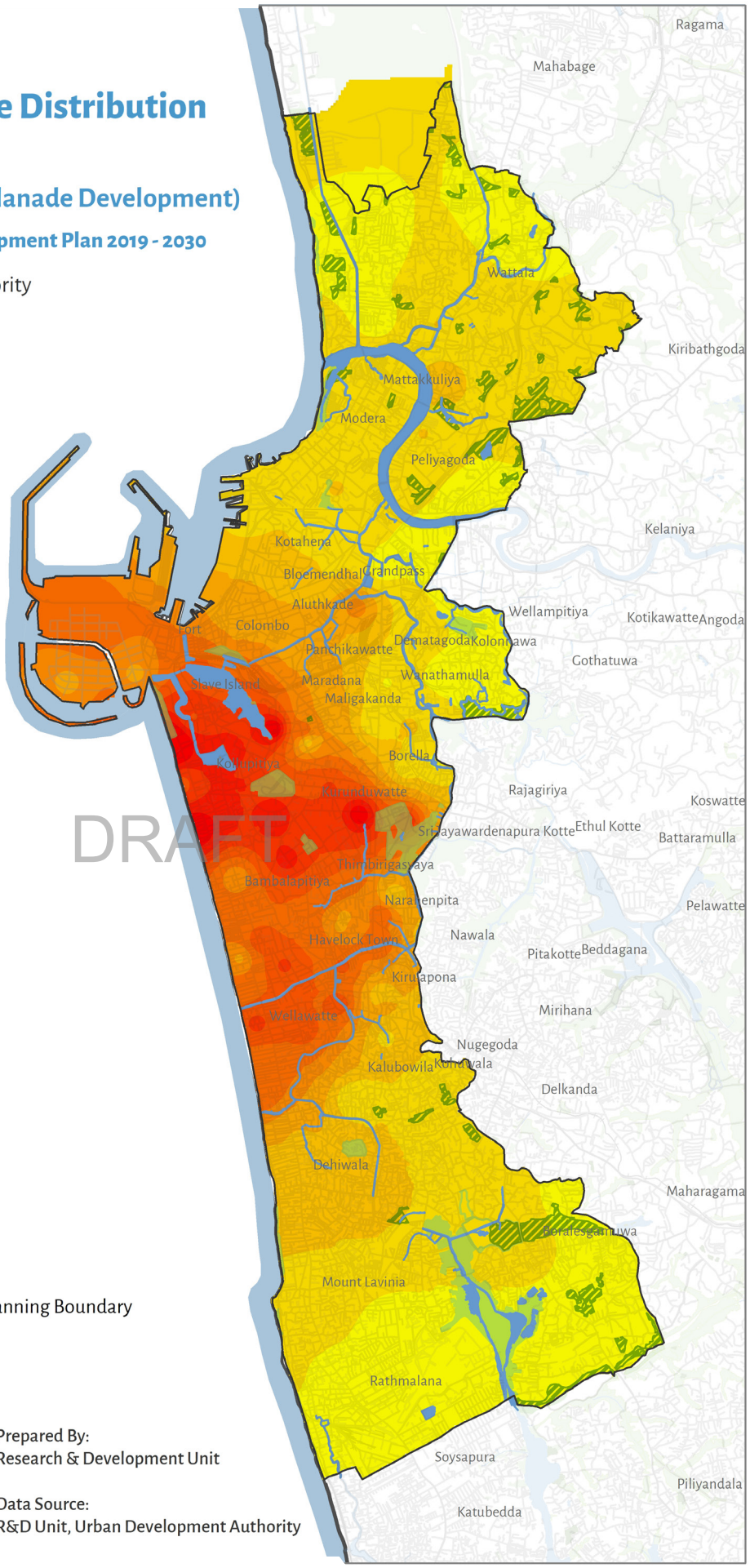
Map 4.8: *Land Value Distribution of Colombo Commercial City - 2018*

Expected Land Value Distribution 2030

(Intervention of Water Esplanade Development)

Colombo Commercial City Development Plan 2019 - 2030

Urban Development Authority
December 2018



Legend

Land Value (LKR)

- <2,000,000
- 2,000,000.001 - 4,000,000
- 4,000,000.001 - 6,000,000
- 6,000,000.001 - 8,500,000
- 8,500,000.001 - 10,500,000
- 10,500,000.01 - 12,500,000
- 12,500,000.01 - 14,500,000
- 14,500,000.01 - 16,500,000
- 16,500,000.01 - 18,500,000
- 18,500,000.01<

Colombo Commercial City Planning Boundary

N
W E
S

0 1 2 4 Km

Prepared By:
Research & Development Unit

Data Source:
R&D Unit, Urban Development Authority

Map 4.9: *Land Value Distribution of Colombo Commercial City - 2030*

4.3.3. Ease of Traffic Congestion and Attraction of Developments due to changes of Integration Pattern

As per the theoretical explanations, roads with higher integration values attract more developments to the road-based corridors. One of the major intentions of introducing water drives is to expose abandoned waterfronts for developments. Hence, the impact of the proposed actions was evaluated with the Space Syntax Analysis by comparing the change of integration values before and after introducing water drives to the existing road network.

As per the analysis, it was identified that the integration levels would relatively increase in areas such as Peliyagoda, Mattakkuliya, Kolonnawa and Attidiya due to the impact of newly introduced water drives (Map 4.10 – Page 82 and Map 4.11 – Page 83). Hence, these areas which can be considered as underutilized in terms of planning point of view, would get the opportunity to attract more developments to the area with enhance integration levels. On the other hand, the proposed Extended Lake Drive indicates a relatively lower integration value, meaning less attraction for developments. This situation will make proposed Extended Lake Drive an ideal traffic bypass road being an alternative to divert excessive traffic in Baseline Road and other major arterials.

NOTE: *Space Syntax Analysis is a technique that can be used for morphological analysis of buildings, architectural plans, urban areas, and urban plans. The aim behind the technique is to describe different aspects of the relationships between the morphological structure of man-made environments and social structures or events.*

The central concept of space syntax is 'integration'. It is supposed that the distribution of integration across an urban area correlates with the movement pattern in that area. Urban areas can be distinguished by, and compared in terms of, different levels of integration. Integration is used as a measure of quality for urban areas. The technique allows one to express integration in numeric values.

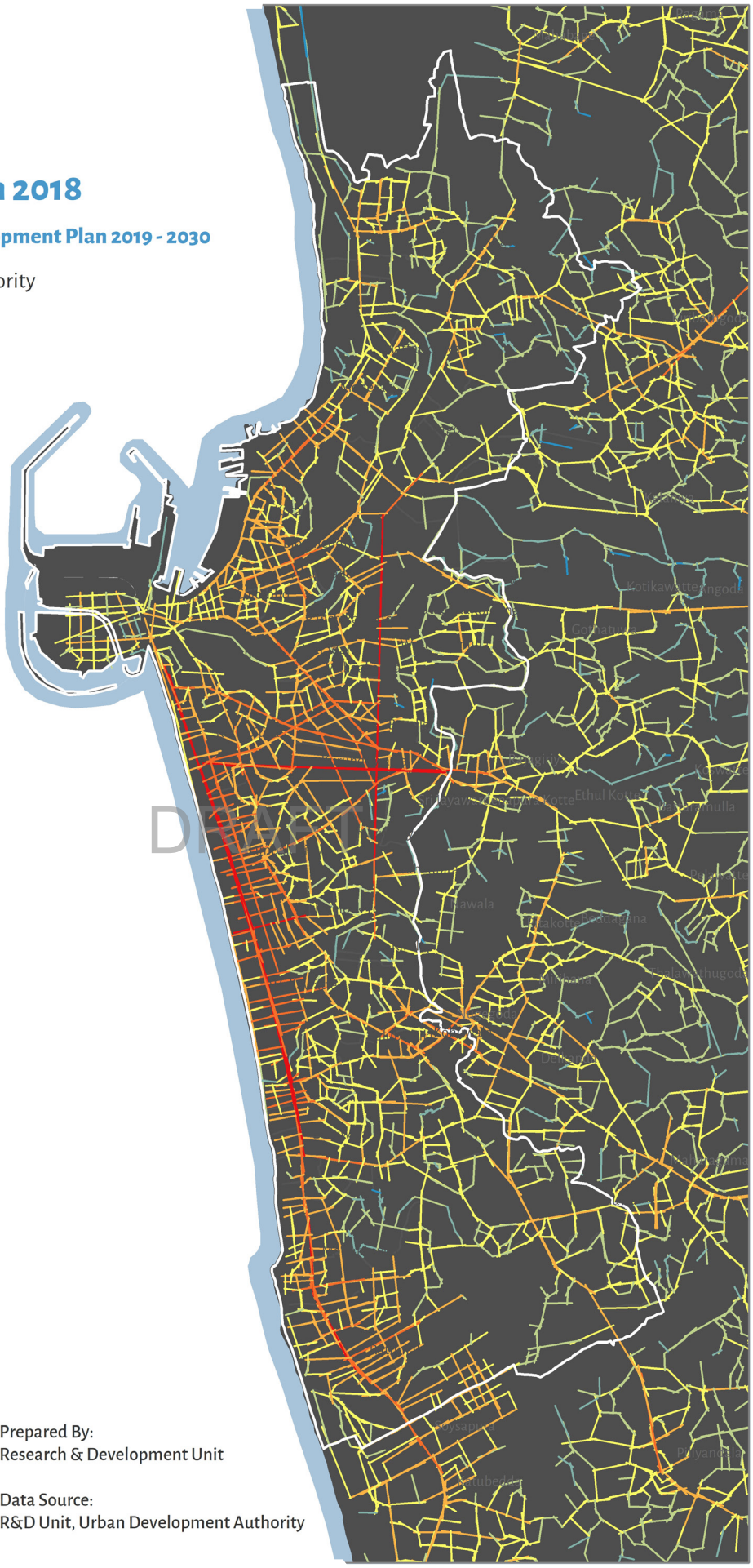
Integration measures how many turns have to be made from a street segment to reach all other street segments in the network, using shortest paths. If the number of turns required for reaching all segments in the graph is analyzed, the analysis is said to measure integration at radius 'n'. The first intersecting segment requires only one turn, the second two turns and so on. The street segments that require the fewest turns to reach all other streets are called 'most integrated' and are usually represented with hotter colors, such as red or yellow. Integration can also be analyzed in local scale instead of the scale of the whole network. In the case of radius 4, for instance, only four turns are counted departing from each street segment.

Theoretically, the integration measure shows the cognitive complexity of reaching a street, and is often argued to 'predict' the pedestrian use of a street: the easier it is to reach a street, the more popular it should be. While there is some evidence of this being true, the method is biased towards long, straight streets that intersect with lots of other streets. Such streets, as Oxford Street in London, come out as especially strongly integrated. However, a slightly curvy street of the same length would typically be segmented into individual straight segments, not counted as a single line, which makes curvy streets appear less integrated in the analysis.

Existing Integration 2018

Colombo Commercial City Development Plan 2019 - 2030

Urban Development Authority
December 2018



Legend

Integration

- < -0.72 Std. Dev.
- -0.72 - -0.39 Std. Dev.
- -0.39 - -0.056 Std. Dev.
- -0.056 - 0.28 Std. Dev.
- 0.28 - 0.61 Std. Dev.
- 0.61 - 0.93 Std. Dev.
- 0.93 - 1.3 Std. Dev.

N
W E
S

0 1 2 4 Km

Prepared By:
Research & Development Unit

Data Source:
R&D Unit, Urban Development Authority

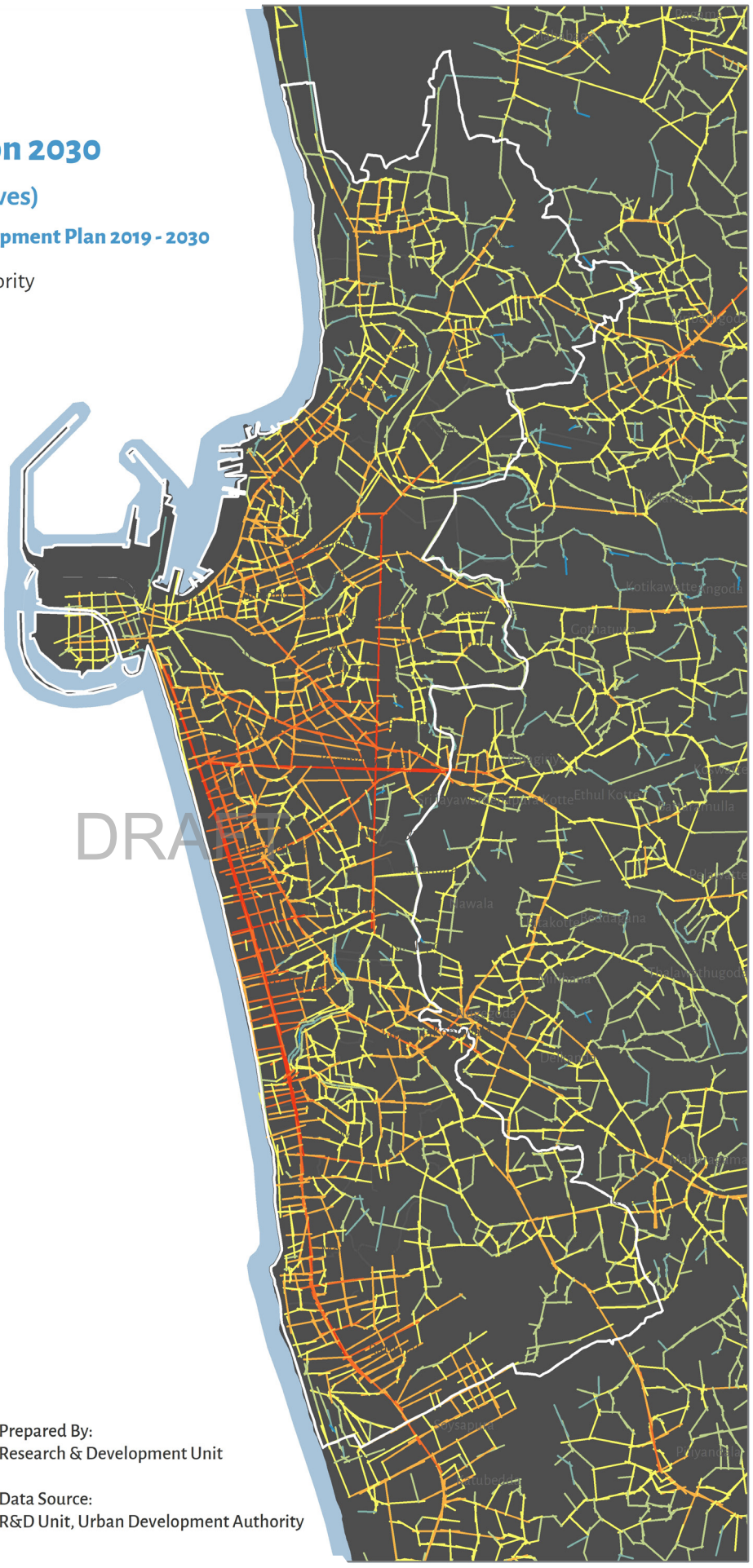
Map 4.10: *Integration Levels of Roads - 2018*

Expected Integration 2030

(Intervention of Water Drives)

Colombo Commercial City Development Plan 2019 - 2030

Urban Development Authority
December 2018



Legend

Integration

- < -0.72 Std. Dev.
- -0.72 - -0.39 Std. Dev.
- -0.39 - -0.056 Std. Dev.
- -0.056 - 0.28 Std. Dev.
- 0.28 - 0.61 Std. Dev.
- 0.61 - 0.93 Std. Dev.
- 0.93 - 1.3 Std. Dev.

N
W E
S

0 1 2 4 Km

Prepared By:
Research & Development Unit

Data Source:
R&D Unit, Urban Development Authority

Map 4.11: *Integration Levels of Roads after introducing Water Drives*