



economics

Report to:

Bay of Connections Governance Group

**STATE OF READINESS REPORT APPENDIX:
PRESENT INFRASTRUCTURE CAPACITY
AND TEN YEAR PLAN FUTURE PROVISIONS**

Prepared by

Adrian Slack

John Williamson

Kel Sanderson

May 2011

Copyright© BERL

REFR ref #4965

Appendix: Present and planned infrastructure capacity

1 Tauranga	6
1.1 Transport	6
1.2 Water	7
1.3 Wastewater	9
1.4 Stormwater	10
1.5 Planned infrastructure expenditure	11
2 Western Bay of Plenty	12
2.1 Transport	12
2.2 Water	13
2.3 Wastewater	14
2.4 Stormwater	15
2.5 Planned infrastructure expenditure	16
3 Whakatane.....	17
3.1 Transport	17
3.2 Water	18
3.3 Wastewater	19
3.4 Stormwater	20
3.5 Land (Whakatane and Kawerau).....	21
3.6 Flood protection.....	22
3.7 Planned infrastructure expenditure	23
4 Kawerau.....	24
4.1 Transport and stormwater	24
4.2 Water	24
4.3 Wastewater	25
4.4 Land.....	26
4.5 Flood protection.....	26
4.6 Planned infrastructure expenditure	26
5 Opotiki	27
5.1 Transport	27
5.2 Water	28
5.3 Wastewater	29
5.4 Stormwater	29
5.5 Planned infrastructure expenditure	30
6 Rotorua.....	31
6.1 Transport	31
6.2 Water	32
6.3 Wastewater.....	32
6.4 Stormwater	34
6.5 Planned infrastructure expenditure	35

7 Bay of Plenty Regional Council	36
7.1 Flood protection assets	36
7.2 Asset maintenance and renewals	38
7.3 Planned infrastructure expenditure	39

Tables

Table 1.1 Current local government infrastructure assets by territorial authority, 2010	3
Table 1.2 Planned local government infrastructure expenditure by territorial authority, 2010-2019	5
Table 1.1 Tauranga City Council transport assets.....	7
Table 1.2 Tauranga City Council planned expenditure, 2010-2019 (\$'000).....	11
Table 2.1 Western BOP additional transport assets required (\$ millions).....	13
Table 2.2 Population Projections for the Western Bay of Plenty Water Supply Zones ...	14
Table 2.3 Western BOP District Council planned expenditure, 2010-2019 (\$'000)	16
Table 3.1: WDC Transport Assets	17
Table 3.2 WDC Water Assets	18
Table 3.3 WDC Wastewater Assets.....	19
Table 3.4 WDC Stormwater Assets	20
Table 3.5 Whakatane Residential Development 2005-2020	22
Table 3.6 Whakatane District Council planned expenditure, 2010-2019 (\$'000)	23
Table 4.1 Kawerau Long Term Asset Renewals.....	24
Table 4.2 Kawerau District Council planned expenditure, 2010-2019 (\$'000)	26
Table 5.1 Opotiki Roding Asset values	27
Table 5.2 Opotiki Water Asset Values	28
Table 5.3 Opotiki Wastewater Asset Values	29
Table 5.4 Opotiki Stormwater Asset Values	29
Table 5.5 Opotiki District Council planned expenditure, 2010-2019 (\$'000)	30
Table 6.1 Rotorua DC Key Infrastructural Assets	31
Table 6.2 Rotorua District Council planned expenditure, 2010-2019 (\$'000).....	35
Table 7.1 BOPRC Flood Protection Asset Values by Catchment	37
Table 7.2 BOPRC Flood Protection Asset Values by Asset Type	37
Table 7.3 Flood Protection Issues	37
Table 7.4 Capital Works – Growth and Demand Summary	39
Table 7.5 BOPRC planned expenditure, 2010-2019 (\$'000)	39

Table 1.1 Current local government infrastructure assets by territorial authority, 2010

Units	Tauranga			Western BoP			Whakatane			Kawerau			
	No.	Value \$'000		No.	Value \$'000		No.	Value \$'000		No.	Value \$'000		
		Total	Unit		Total	Unit		Total	Unit		Total	Unit	
Transport													
Roads unsealed	km			220	29,006		203						
Roads sealed, rural	km			661	398,198		569						
Roads sealed, urban	km			144	86,748		130			42			
Total roads	km	516	280,486	544	1,025	513,953	501	902	259,233	287	42	16,222	386
Bridges	no.	15	25,250	1,683	107	25,061	234	154	39,454	256	1	1,014	1,014
Footpaths	km	648	41,917	65	147	9,027	61	194	17,373	90	90	5,370	59
Road furniture			57,384			42,590			8,700				2,098
Total value			405,037			590,631			324,760				24,704
Waters													
: Stormwater													
Pipes	km	705	221,664	314	121	76,490	633	104	50,429	486	45	13,336	294
SW Drains	km	78.8	14,206	180.4	31.7	2,596	81.9	36.2	1,463	40.4			
Drainage	km					1,651			12,539				
Dams	no.				1	101	101	19	883	46			
Pump stations	no.	3	190	63	6	1,027	171	17	6,040	355			
Total value			236,060			81,864			71,354				13,336
: Potable water													
Connections	no.	50,061	40,532		74	3,129		12,235	8,626		2,657		
People served	no.	110,826			31,000			30,340			6,921		
Pipes and pumps	km	1,257	168,625	134	669	109,672	164	520	86,582	167	70		
Reservoirs	no.	44	27,639	628	27	12,880	477	32	5,606	175	3		
Pump stations	no.	4	12,916	3,229	20	716	36	17	3,573	210	2		
Total value			249,712			126,397 *			104,387				22,000
Volume - actual use	m3/day	24,657			4,227			15,595			3,800		
Volume - potential (capacity)					10,333						11,000		
: Wastewater													
Connections	no.	47,547	34,051		35	5,932		8,366	12,722		2,657		
People served	no.	111,426			15,800			22,590			6,921		
Rising mains	km	78	22,414	287	64	40,353	631	35	11,509	331	1		
Gravity mains	km	1,020	188,933	185	180	60,754	338	144	36,938	256	52		
Pump stations	no.	158	32,938	208	58	16,983	293	48	7,467	156	2		
Treatment plants	no.	2	71,944	35,972	3	16,108	5,369	6	7,364	1,227	1	4,468	
Total value			350,280			140,130			63,278				15,463
Community (parks, reserves, theatres, etc)													
			399,564					Other	80,016				
								Airport	1,000				
Total value			399,564						81,016				
Land													
			770,746 [§]										
Total value			770,746										
Flood protection													
Erosion Protection	km												
Pump Stations	no.												
Stopbanks	km							6.5					
Structures	no.							5 [§]					
Waterways	km												
Total value													

Total (replacement value, \$000s)	2,411,399	939,023	644,795	75,503
Population (2010)	110,826	44,430	33,209	6,767
Total per capita (\$/person)	21,758	21,135	19,416	11,158

Notes: [§] Excludes land under roads. * WBoP DC also has 18 intakes (\$9.77m) and 11 treatment plants (\$3.06m) in potable water [§] Flood gates

Units	Opotiki			Rotorua ‡			BoPRC			TOTAL	
	No.	Value \$'000	Unit	No.	Value \$'000	Unit	No.	Value \$'000	Unit	No.	Value \$'000
Transport											
Roads unsealed	km	187	111,298 †	354 †	179						
Roads sealed, rural	km	127			824						
Roads sealed, urban	km	27	17,566	658							
Total roads	km	341	128,864	378	1,003	219,400	219			3,829	1,418,158
Bridges	no.	51	14,520	285	96	12,400	129			424	117,699
Footpaths	km		2,023		412	24,900	60			1,491	100,610
Road furniture			520			4,700					115,992
Total value			274,791		261,400					1,881,323	
Waters											
: Stormwater											
Pipes	km				230					1,205	361,919
SW Drains	km									147	18,265
Drainage	km				89.1					89	14,189
Dams	no.				3					23	984
Pump stations	no.				2					28	7,257
Total value			1,520		57,100					461,233	
: Potable water											
Connections	no.				24,000					89,027	52,287
People served	no.	5,760			52,958					237,805	
Pipes and pumps	km	103			688					3,306	364,879
Reservoirs	no.				22					128	46,125
Pump stations	no.	6			16					65	17,205
Total value			15,420		179,100					697,016	
Volume - actual use	m3/day	1,500									
Volume - potential (capacity)		4,500									
: Wastewater											
Connections	no.									58,605	52,705
People served	no.									156,737	
Rising mains	km									177	74,276
Gravity mains	km									1,396	286,625
Pump stations	no.									266	57,388
Treatment plants	no.					37,000				12	136,884
Total value			7,225		37,000					613,376	
Community											
Total value										480,580	
Land											
Total value					11,400					782,146	
Flood protection											
Erosion Protection	km						47	23,263	495	47	23,263
Pump Stations	no.						12	7,040	587	12	7,040
Stopbanks	km						34	136,632	4,019	41	136,632
Structures	no.							9,704		5	9,704
Waterways	km						48	13,418	280	48	13,418
Total value								190,057		190,057	
Total (replacement value, \$000s)			298,955		546,000			190,057		5,105,732	
Population (2010)			8,779		66,395			270,406		270,406	
Total per capita (\$/person)			34,053		8,224			703		18,882	

† Rural sealed + unsealed roads ‡ Book value (July 2008 dollars)

Unit values not calculated due to incomplete quantity/value data.

Table 1.2 Planned local government infrastructure expenditure by territorial authority, 2010-2019

<i>(Value \$'000)</i>	Western						BoPRC	TOTAL
	Tauranga	BoP [#]	Whakatane	Kawerau*	Opotiki	Rotorua		
<i>By type</i>								
Transport	432,894	183,313	134,000	3,543	12,373	150,152		914,503
Stormwater	184,205	23,800	11,611		416	11,637		233,441
Potable water	227,656	183,300	26,945	7,191	1,114	28,997		475,203
Wastewater	310,321	32,600	36,080	780	1,526	145,299		526,606
Community Land Flood Protection							22,040	22,040
<i>By expenditure category</i>								
Capex - Renewals	160,235	23,013	115,482	11,514		122,751	9,940	442,935
Capex - Growth	782,600	88,900	16,336		8,980	184,950	2,100	1,083,866
Capex - Level of Service	212,242	71,400	83,719			28,384	10,000	405,745
Total Capex	1,155,077	423,013	208,636	11,514	15,429	336,085	22,040	2,171,794
Population growth 2010-2019	22,452	7,076	1,278	-57	196	4,382	35,328	35,328
Capex - growth (\$'000) per additional person [†]	34.9	12.6	12.8	0.0	45.9	42.2	0.1	30.7
Projected population, 2019	133,300	51,500	34,500	6,700	8,950	70,800	305,750	305,750
Total Capex (2010-2019) per person in 2019	8.7	8.2	6.0	1.7	1.7	4.7	0.1	7.1

Notes: N.b. This table reported planned expenditure on local government infrastructure. Comprehensive information on the total quantity of infrastructure by type that is planned out to 2019 is not available in the council plans and documentation that were used to compile this table.

[#] The breakdown for Western BoP by expenditure category is for the Transport category only.

* Kawerau Transport/Stormwater expenditure split equally across categories in the Regional Total figures.

[†] Total capex per additional person calculated based on total capex across all territorial authorities plus the Regional Council.

1 Tauranga

Tauranga is notable for the scale of growth it has experienced and the subsequent financial implications as growth placed increasing pressure on existing infrastructure. Due to the desire to keep property rates low (Tauranga has the second lowest property rates of the 12 largest New Zealand cities) costs of infrastructure required to accommodate growth and continue meeting asset performance measures are met by debt, serviced by development contributions. Any downturn in development naturally impacts on Council's ability to service debt. Conversely, accelerated development will increase the need for investment. Overall, the costs of growth are highly visible in Tauranga and meeting these costs whilst containing rates rises has proved to be a significant challenge for the Council.

Although we focus on 'hard infrastructure' below, Tauranga faces a challenge with respect to community infrastructure. Providing the hard infrastructure for growth, whilst facing reduced development contributions and pressure to limit rates rises, places pressure on the Council's ability to fund community infrastructure. Yet to attract high productivity workers and to enable them to realise their potential, it is critical to support them with access to attractive workplaces and appropriate technology and infrastructure. This includes meeting the demand for higher levels of community infrastructure expected of a major urban centre.

1.1 Transport

SmartTransport is a partnership between Tauranga City Council, New Zealand Transport Agency, Western Bay of Plenty District Council, and Environment Bay of Plenty intended to deliver an integrated strategic transport network.

A key goal for Transportation policy is to change travel behaviour from a predominantly private car focus to sustainable modes such as buses, cycling and walking. Council sees this being achieved by providing appropriate infrastructure and enforcement supported by communication and education programmes.

The 2006 census showed 7 percent of all commuters used modes other than private motor vehicles to travel to work. The target for 2011 is to have 14.5 percent using sustainable modes. The travel change behaviour programme contributed to a noticeable increase in the use of buses (presently growth is 20 percent p.a.).

1.1.1 Asset Management

The transport assets of Tauranga City Council can be summarised as follows:

Table 1.1 Tauranga City Council transport assets

TCC Transport Assets	
Roads	516 km
Bridges	15
Footpaths	648 km
Bus shelters	87
Pay and Display machines	158

The assets are managed in accordance with Asset Management Plans which set priorities and maintenance levels of service.

The LTP provides a comprehensive overview of performance against levels of service. Key observations are:

- The key transport measure reported against is 'efficiency of the transport network'. This is measured using what is termed an "all day congestion indicator" (minutes of delay* per km of travel on key city routes). The target is for no increase over 2007/08 delays of 0.37 minutes of delay per km travelled. No report of performance is given, but the 2007 is less than that recorded in 2004/05 (0.4 minutes/km) but more than the 2005/06 level of 0.33 mins/km.
- All other indicators show either that desired performance has been attained or not measured.
- Future targets focus on either maintaining or improving performance levels.

This indicates that council intends to find ways in which to ensure the transport system continues to function at current or improved levels in the future. Nevertheless, it is acknowledged that growth continues to place pressure on transport assets.

1.2 Water

Tauranga's water is sourced from the Tautau and Waiorohi streams in the foothills of the Kaimai ranges. Water supplies in Tauranga have undergone major redevelopment since 1995. The City is currently supplied by the Joyce and Oropi Road processing plants using microfiltration as leading international technology to produce high quality water. Key facts about the asset's performance include:

- Water quality in Tauranga meets Aa Grade water quality as defined by the NZ Drinking Water Standards (MoH) 2005.
- Asset renewal programmes are in place to ensure that the system infrastructure continues to meet existing levels of service in perpetuity
- The development of bulk infrastructure to meet city-wide growth is co-ordinated in-house whereas infrastructure associated with subdivision development is developer driven and then vested in the Council as assets
- Residential, rural-residential, commercial and industrial properties receive a water supply that complies with Council's Code of Practice for Development and the NZ Fire Service Code of Practice.
- Maintenance of the water supply network is contracted out under a performance based contract with specified response times and customer satisfaction indices.
- The city uses universal metering with all customers paying user charges for water with quarterly reading cycles for domestic users and monthly for larger commercial industrial users.
- The Waterline programme's goal is the promotion of efficient water use by the community. The programme is a free customer service largely aimed promoting awareness through household visits, leak detection, talks to community groups, and a schools' education programme.

Plans for meeting future demand include:

- Provide further reservoir storage in the Eastern Coastal Zone and other developing areas.
- Working with Western Bay of Plenty District Council on sub-regional plans for water resources and infrastructure to meet SmartGrowth predictions.¹
- New works in progress. The Assessment of Environmental Effects has been completed process underway to secure resource consents and designation for proposed Waiari Scheme, which includes a new water intake, water treatment plant, water storage and a new trunk main to deliver the water to the existing infrastructure serving Papamoa. Physical work on the scheme scheduled to start in 2014.
- Regularly updating Asset Management Plans.

¹ Tauranga City Council and Western Bay of Plenty District Council share a resource consent to take up to 30,000m³/day from the Waiari Stream, located on the southern side of Te Puke.

1.3 Wastewater

The council operates two wastewater treatment plants at Chapel Street and Te Maunga, all pipelines and pump stations. According to Council's LTP Tauranga's wastewater network is generally in good condition. However, asset management issues include:

- Some of the concrete and asbestos cement trunk sewers laid in the 1970s have corroded due to the action of hydrogen sulphide and require replacement or rehabilitation.
- An emerging issue is the premature failing of mPVC rising mains.
- As the population increases with infill and greenfield development the wastewater flows increase through the existing reticulation and pumping stations.
- Approximately 20 pumping stations no longer comply with the Council's Code of Practice for Development in terms of pumping capacity and emergency storage.

The Council's objective, as per the LTP, is to achieve the following:

- A reticulation system that continues to meet good industry practice regarding the small number of blockages, breakages and overflows.
- All pumping stations complying with the Council's Code of Practice criteria for pumping capacity and emergency storage.
- Both wastewater treatment plants consistently meeting their discharge consent conditions for discharge to the ocean and for irrigation of reclaimed water.
- All dwellings, industrial and commercial premises in urban zones connected to the wastewater system.
- A biosolids management plan adopted and implemented that will enable the solids produced from each wastewater treatment plant to be treated and disposed of in a sustainable manner in accordance with the NZ Waste Strategy and the NZ Guidelines.

The Council's actions to achieve the objectives include:

- Continuing to rehabilitate deteriorated trunk and reticulation mains in accordance with the prioritised pipe renewal programme to ensure the parts of the reticulation at risk of failure are renewed before they collapse.
- Monitoring pumping station performance and updating the pumping station upgrade programme to ensure pumping capacity and emergency storage keep pace with population growth.
- Undertaking the investigation, design and construction of the major trunk mains required to keep ahead of the City's growth as predicted by SmartGrowth. The first such project

is the Southern Pipeline. The \$106.1 million² pipeline will transfer sewage from Tauriko/Greerton to the Te Maunga Wastewater Treatment Plant. The Council notes that it will reduce pressure on the rest of the city's wastewater system.³

1.4 Stormwater

Analysis of the stormwater systems in the City has identified significant upgrading works required.

- According to Council data most residential buildings are not at risk from inundation in a 10 year rainfall event, however the number at risk from a 50-year rainfall event is uncertain. But although pipes and sumps in the newer areas are typically designed to cope with a 5 or 10 year rainfall event, in older areas many of the primary systems can only cope with a 2-year rainfall event.
- To deal with this overland flowpaths (on streets and reserve areas) are intended to convey floodwaters that exceed capacity of the primary systems. can double as overland flowpaths.
- The situation is worsened by updated rainfall data and expected effects of climate change with a prediction of a greater number of high intensity rainfall events in the future.

Quality and cultural issues have also been identified:

- The quality of water discharged to the harbour, particularly from industrial areas, is poor.
- Treatment methods, such as ponds, filter devices and pollutant traps are being required to improve the quality of the stormwater discharging from urban catchments to receiving waters.
- Tangata Whenua have unresolved issues regarding stormwater activities, principally related to the discharge of stormwater into streams, the harbour and the ocean. There are also issues in regards to physical works such as pipe installation and detention pond construction.

The Council aims to:

- Confirm through modelling all residential, commercial and industrial buildings that are at risk of flooding in 5 and 50 year flood events.
- Update the stormwater flooding records

² 2009 dollar terms.

³ Accessed 27 April 2011. <http://www.tauranga.govt.nz/council-projects/southern-pipeline.aspx>

- Ensure that the quality of stormwater being discharged into the harbour, rivers and the ocean has minimal adverse environmental impacts on the receiving environment.
- Complete all necessary upgrading works. (Note that on the current rate of investment this will extend well beyond the 10 years of the current LTP).
- Provide additional operational and capital funding for initiatives to improve the quality of water being discharged into the harbour, rivers and the ocean.
- Implement upgrading capital works using innovative approaches to make best use of available funds.

1.5 Planned infrastructure expenditure

The table below summarises the council's planned expenditure on infrastructure over the 10 year period between 2010 to 2019, by type and expenditure category.

Table 1.2 Tauranga City Council planned expenditure, 2010-2019 (\$'000)

Tauranga City Council	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Transport											
Capex - Growth	10,308	12,250	14,554	32,136	29,930	24,110	35,344	21,043	35,072	61,673	276,421
Capex - Renewals	6,206	6,385	6,777	7,509	6,847	7,416	7,294	7,670	7,790	7,999	71,894
Capex - LOS	7,688	9,072	5,600	13,074	6,190	5,546	8,016	6,624	11,683	11,086	84,579
Total capex - Transport	24,202	27,708	26,931	52,719	42,967	37,072	50,654	35,338	54,545	80,758	432,894
Water supply											
Capex - Growth	10,645	11,294	23,369	10,001	9,875	34,687	50,642	15,151	1,657	1,804	169,126
Capex - Renewals	4,015	5,068	4,964	3,836	3,776	4,186	6,136	5,030	6,479	4,552	48,044
Capex - LOS	1,405	2,941	2,085	436	409	422	435	449	1,427	477	10,487
Total capex - Water supply	16,066	19,303	30,418	14,274	14,060	39,296	57,213	20,631	9,563	6,833	227,656
Wastewater											
Capex - Growth	13,932	34,184	26,917	40,949	55,335	10,784	6,448	10,975	17,408	20,020	236,952
Capex - Renewals	5,570	3,168	3,257	3,293	3,384	6,388	3,603	3,717	3,832	3,992	40,205
Capex - LOS	4,674	3,436	5,996	1,248	8,404	463	835	7,631	254	224	33,164
Total capex - Wastewater	24,176	40,789	36,170	45,490	67,124	17,634	10,886	22,323	21,494	24,236	310,321
Stormwater											
Capex - Growth	3,689	3,992	10,723	7,322	10,381	6,708	16,147	11,448	14,822	14,870	100,101
Capex - Renewals	0	3	0	12	12	2	0	35	29	0	93
Capex - LOS	9,392	6,178	6,157	6,030	9,233	10,566	7,778	10,890	9,471	8,317	84,012
Total capex - Stormwater	13,081	10,173	16,880	13,364	19,626	17,276	23,925	22,373	24,322	23,187	184,205

N.b. "LOS" = Level of Service

2 Western Bay of Plenty

A key issue for the Western Bay of Plenty is funding. When the District was created it received little in the way of investments it could use to bring the infrastructure up to standard apart from a relatively small amount of electricity reform shares, which it sold to support the Council's Disaster Contingency Fund. This is Council's only major reserve, with a balance of \$5,188,000 in 2009.

The demands of growth have been exacerbated in the Western Bay by the nature of settlement, with satellite towns spread from one end of the district to the other, interspersed with rural land. To meet the demands of growth, upgrades of infrastructure were urgently required for roading, sewerage, potable water and stormwater. Over the last 22 years Council has invested actively in new and upgraded infrastructure, including:

- Refurbished wastewater treatment plants in Katikati and Te Puke;
- New wastewater schemes in Waihi Beach and Omokoroa; • Seal extensions and road widening; • Improving stormwater levels of service by increasing capacity for new subdivisions and for anticipated future growth;
- Significantly increasing the quality and reliability of supply of potable water

Western Bay of Plenty District's population is expected to grow by 19.7 percent between 2009 and 2019 (the period of the latest LTP) with the number of rateable properties forecast to increase by 20.6 percent.

2.1 Transport

Transport assets include the roading network comprising 756km of sealed and 276km of unsealed roads.

The 2009-19 LTP notes that in recent years transport infrastructure in the subregion "has come under significant pressure from various growth-related demands. These include rapid population growth, increasing levels of freight traffic on both rail and road corridors, expansion of the Port of Tauranga and the continued development of the tourism industry across the Bay of Plenty."

While these pressures have increased, capital investment in the transport network has not matched growth rates.

The effect is perceived to be one of under-investment resulting in substantial economic and social costs for the community and an urgent need for solutions due to rising congestion, heavy vehicle traffic, travel times and travel costs continue in the District and subregion.

The effect has been for the Council to broaden its transport focus from purely roading to the safe and efficient movement of people and goods, considering the potential contribution of all transport modes to the District's economic, social and environmental wellbeing.

Notably, although Council committed in 2006 to the establishment of an alternative route to divert through-traffic from Jellicoe Street, Te Puke the cost of the project is now estimated at \$30 million which is considered unaffordable during the ten years of the LTP and the project has not been included in the financial projections.

Council considers that the Tauranga Eastern Motorway (TEM) will alleviate congestion in the long term and is focusing on that project in the interim but is also requesting that NZTA review traffic efficiency, congestion and safety in Jellicoe Street, Te Puke.

Transportation infrastructure identified in adopted Structure Plans for the ten year period and funded through financial contributions, include Omokoroa (\$26.2 million), Katikati (\$6.5 million), Waihi Beach (\$4 million) and Te Puke (\$6.7 million). Expenditure will be reviewed annually to take into account actual growth and current proposed and future development.

Table 2.1 Western BOP additional transport assets required (\$ millions)

Category	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19
Additional LoS	5.8	7.9	4.4	9.7	7.3	7.7	8.6	7.2	4.9	7.9
Additional capacity for growth	12.5	14.5	11.8	8.4	8.5	6.0	6.2	6.4	7.2	7.4
Renewals	0.075	0.085	0.053	2.7	3.0	3.1	3.2	3.4	3.6	3.8
Total Capex	18.5	22.5	16.3	20.8	18.8	16.8	18.0	17.0	15.6	19.0

2.2 Water

Council supplies water to approximately 31,000 people in the District, via three supply zones (Central, Eastern and Western supply zones). Water treatment, storage and distribution is provided by Council in each of the supply zones through the operation and maintenance of water treatment and pumping stations, reservoirs and the distribution network.

All water provided by Council now comes from secure bore sites.

Council intends to focus on supply for households, livestock, industrial and commercial customers in the future, as Environment Bay of Plenty is better able to manage large scale irrigation and frost protection demands.

In 2007, water was supplied to approximately 74 percent of the district population. Under the SmartGrowth base case, the number of consumers is expected to increase to approximately 81 percent of the district's population by 2051, with the majority being located in urban areas. The significant increase in connected population translates into increases in average and

peak daily water demand.

These changes have been analysed using network models for each water supply zone. Areas of the supply zones with inadequate supply flow and pressure for future demand have been identified, and proposals developed for augmentation of the water networks as documented in the Water Asset Management Plan. The latest proposed network upgrades are included in LTP 2009-19. This includes a capacity upgrade for the Pongakawa Water Treatment Plant 2015/16 (\$969,000)

Demand management strategies are being investigated and include the monitoring of water use volumes to identify and reduce “unaccounted” water losses from the networks. If the extent of this non revenue water can be reduced the need for additional early capital and maintenance expenditure can be deferred.

A summary of the water supply zone population projections for the District is presented in Table 2.2.

Table 2.2 Population Projections for the Western Bay of Plenty Water Supply Zones

Supply Zone	2006	2026	2051
Western	10,878	16,010	22,800
Central	14,793	23,800	29,140
Eastern	16,182	20,000	24,500
Total	41,853	59,810	76,440

2.3 Wastewater

The key asset management information provided by the district shows that wastewater systems are generally well specified to meet demand arising from future growth:

- The three existing wastewater treatment plants have been assessed to provide sufficient capacity to meet demand until 2016.
- There is adequate capacity in the existing Waihi Beach sewer reticulation system to cope with the additional connections up to and beyond 2050.
- In Katikati and Te Puke upgrades of some sewer mains will be scheduled from 2013 to accommodate growth beyond 2050.
- The Omokoroa wastewater scheme has been sized to cater for the expected development on the Peninsula based on Council’s Structure Plans.
- Public health, rules and population growth considerations will determine the priority areas for future wastewater scheme development. Currently under investigation are schemes in Maketu, Little Waihi, Pukehina and the small northern communities.

2.4 Stormwater

Council's stormwater systems service thirteen discrete urban communities. Assets include (across the district):

- 99,035m of stormwater pipes
- 5,700m of open drains
- 6 pump stations.

Council's current wastewater infrastructure is divided into four main service areas: Waihi Beach, Katikati, Te Puke and Omokoroa.

Demand for additional wastewater services is driven principally by population growth, environmental degradation and public health issues. Waihi Beach also experiences additional demand driven by holiday makers. The pattern of growth is controlled to a certain extent by the land use zones and associated rules of the District Plan. Council's LTP identifies four residential growth centres: Waihi Beach (including Island View, Pios and Athenree), Katikati, Omokoroa, and Te Puke. Some of the growth will be in the form of rural lifestyle blocks where stormwater is normally dealt with on site with no associated Council stormwater assets. In this type of development Council's role is to ensure that the stormwater control proposed by the developer meets Council design standards. This is achieved through the building consent process.

Over the next ten years only minor capital works are programmed for the Omokoroa, Waihi Beach, Katikati and Te Puke schemes as historical upgrades have provided sufficient capacity to meet projected demand. However, as most of the current Resource Consents have to be renewed during this period, the proposed capital works programme may be influenced by Resource Consent requirements.

Levels of service are defined through legislative requirements and resource consent conditions pertaining to the quality and quantity of discharges from treatment plants. All treatment plants comply with these service levels and no changes are anticipated in the short to medium term.

Other growth will occur in the areas zoned in the District Plan as Residential, or Rural-Residential. These areas are generally adjacent to existing urban or rural-residential areas, which are already serviced by Council networks. There is a significant area south of Omokoroa Beach zoned for future urban. Future development of these areas will involve significant extension of, or new, Council owned stormwater assets. However, the majority of new development will be carried out and funded by developers. Council will take ownership

of the stormwater assets, without having to fund them, but will take on the responsibility of long-term maintenance.

For areas where existing residential areas are developed to a higher density, the developer will be required to demonstrate that the downstream stormwater systems have the capacity within the hydraulic design criteria to take the additional flow. In some cases upgrading of the downstream system may be required in which case Council and/or the developer will upgrade the downstream system prior to carrying out the work. Where the upgrade work fits in with Council's replacement programme, or alleviates existing flooding problems, Council would pay for the upgrade through the capital works programme. Where the only benefit of the upgrade is to allow development upstream, Council may require the developer to fund the upgrade.

2.5 Planned infrastructure expenditure

The table below summarises the council's planned expenditure on infrastructure over the 10 year period between 2010 to 2019, by type (and expenditure category for Transport).

Table 2.3 Western BOP District Council planned expenditure, 2010-2019 (\$'000)

Western Bay District Council	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Transport											
Capex - Growth	12,500	14,500	11,800	8,400	8,500	6,000	6,200	6,400	7,200	7,400	88,900
Capex - Renewals	75	85	53	2,700	3,000	3,100	3,200	3,400	3,600	3,800	23,013
Capex - LOS	5,800	7,900	4,400	9,700	7,300	7,700	8,600	7,200	4,900	7,900	71,400
Total capex - Transport	18,375	22,485	16,253	20,800	18,800	16,800	18,000	17,000	15,700	19,100	183,313
Water supply											
Capex - Growth											
Capex - Renewals											
Capex - LOS											
Total capex - Water supply	18,500	22,500	16,300	20,800	18,800	16,800	18,000	17,000	15,600	19,000	183,300
Stormwater											
Capex - Growth											
Capex - Renewals											
Capex - LOS											
Total capex - Stormwater	2,400	1,100	1,600	2,300	2,600	5,100	3,500	2,100	2,400	700	23,800
Wastewater											
Capex - Growth											
Capex - Renewals											
Capex - LOS											
Total capex - Wastewater	2,900	3,800	4,500	9,100	2,300	4,100	1,300	400	3,200	1,000	32,600

N.b. "LOS" = Level of Service

3 Whakatane

Land use in the district is best summarised as one third forestry, one third pastoral and one third national park.

3.1 Transport

WDC's road network consists of approximately 902 km of predominantly rural roads. Over 76 percent of the network is sealed, which is above the national average of 60 percent. The development of the network has largely been guided by the 'valleys and plains' type topography. In this context, ridge roads define the four major river valleys (Rangitaiki, Whakatane, Waimana and Tarawera Rivers). A network of roads on the western side of the district was developed after draining of a peat swamp in the 1940s.

Table 3.1: WDC Transport Assets

Asset	Value (\$million)
Drainage	12.5
Footpaths	9.8
Traffic islands	2.4
Railings	0.6
SW Channels	410.1
Signs	0.6
Bridges	26.5
Carparks	2.3
Streetlights	3.0
Cariageway	162.0
Whakatane Airport	1.0
Replacement Cost	\$231.6m

A key weakness perceived of the Whakatane catchment is its propensity for natural disasters. Route security is currently under investigation and findings should be included in the next review. Demand for industrial land in Whakatane is seen to be held back by trucks having to skirt around the town rather than pass through it.

Whakatane, Piripai and Ohope are areas expected to see commercial development take place. The increase in traffic may cause congestion on local streets. The use of alternative routes and bypasses is one way to mitigate traffic congestion in built up areas. The forthcoming Transportation Study will investigate alternative routes for the district.

3.2 Water

The Whakatane District Council provides 30,340 people in its area with water services. Its water assets are summarised in the table below:

Table 3.2 WDC Water Assets

Asset	Description
Connections	12,535
Water pipes	519.5kms
Meters	9,908
Pump Stations	17
Treatment Plants	7
Reservoirs	32
Replacement Cost	\$103.5m

The total Gross Replacement Cost for Whakatane's water supply infrastructure is \$103.5 million (\$61.3 million optimised depreciation replacement cost).

Population growth and demand effects are expected to be felt in Whakatane and Ohope which is likely to mean upgrades to infrastructure. The main impacts are likely to include:

- Increased pressure on existing infrastructure and water sources
- Increase in water consumption
- Requirement for robust asset data and network modelling to assist in decision making
- Increase in assets vested in the Council
- Increase in maintenance, operations and depreciation costs to residents

WDC is in a large catch up programme to ensure long term sustainability of assets. Key drivers such as community health and legislative responsibilities have been used to assess the order in which projects will be undertaken.

Although water is recognised by the Council as an area where intensive work is needed to maintain the network, affordability issues have led to a number of projects that would have increased levels of service (totally \$8 million) being deferred between one and three years. Projects that increase levels of service and would have been loan funded have been deferred until such time as high risk projects have been undertaken. Deferred projects include: water treatment plant upgrades, reticulation upgrades in Coastlands, and upgrades in Awakeri/ Whakatane West.

3.2.1 Water Schemes

District is served by ten water schemes. The four major schemes/areas are:

- **Whakatane** The treatment plant has a capacity of 12,000m³/day, water is pumped into three supply reservoirs and then reticulated or pumped to a further 8 reservoirs for the higher areas of the scheme.
- **Ohope** Water is purchased from the Whakatane Scheme, where in normal circumstances the two storage reservoirs service without the need for booster pumps
- **The Plains** Water is drawn from an artesian spring near the Tarawera River and supplies around 8,400 residents
- **Edgecumbe** With no direct water source, water is purchased from the Plains Scheme, and services approximately 1,730 residents.

3.3 Wastewater

The Whakatane District Council provides 22,590 people in its area with water services. Its wastewater assets are summarised in the table below:

Table 3.3 WDC Wastewater Assets

Asset	Description
Connections	8,265
Rising main pipes	35.39kms
Gravity main pipes	140.09kms
Pump Stations	46
Treatment Plants	13
Replacement Cost	\$73.3m

The total Gross Replacement Cost for Whakatane's wastewater infrastructure is \$73,321,015 as at 1 July 2008. GRC for the wastewater assets associated with the Whakatane Scheme amounts to \$42,901,476 (as at 1 July 2008). The Ohope Scheme amounts to \$15,999,570.

The Council sets targeted rates to fund the majority of wastewater services for the individual wastewater networks in the district. These rates are set on a differential basis based on provision of service, land use and location.

Within the Council's capital works programme development expenditure (relating to growth) for the next 10 years has been estimated at \$2.686 million to upgrade or extend facilities. Funding from Development Contributions is estimated at approximately \$1.127 million for the next 10 years

The asset management plans indicate that both Whakatane and Ohope treatment plants have reached end of asset life. Key issues include:

- **Whakatane:** Growth in the network leads to insufficient capacity in the treatment plant under high growth scenario. There is potential for growth to encroach on the buffer area of the treatment ponds, Alternatives are being looked at (eg inhibiting growth, de-sludging survey).
- **Ohope:** Non-compliance with resource consent conditions. Discharge consent expires in 2010 and there are cultural and social issues to factor into the renewal of the resource consent.

3.4 Stormwater

The design standard for the Whakatane township's stormwater reticulation system is to cope with a 1:10 year event with no surface flooding and a 1:50 year event with surface flooding being drained away using overland flow paths.

The stormwater assets of Whakatane District Council are summarised in the table below:

Table 3.4 WDC Stormwater Assets

Area Scheme	Value (\$ million)
Whakatane	38.2
Ohope	5.6
Edgecombe	3.7
Taneatua	1.2
Matata	0.6
Te Teko	3.6
Otarawairere	0.1
Te Mahoe	1.0
Taiwhakaea	0.02
Replacement value	\$55m

With respect to its stormwater assets, the Council is in a large catch up programme to ensure long term sustainability of assets. Key drivers such as community health and legislative responsibilities have been used to assess the order in which projects will be undertaken. Projects that increase levels of service and would have been loan funded have been deferred until such time as high risk projects have been undertaken.

The Council has identified the expected growth, demand and flooding issues for its various schemes. The main growth and demand effects are expected to occur in Whakatane and Ohope, where upgrades to infrastructure due to residential growth and levels of service are expected.

3.5 Land (Whakatane and Kawerau)

The Industrial Land Strategy (ILS) prepared by Property Economics for Whakatane and Kawerau Districts (2007) found as follows:

- Currently Whakatane and Kawerau combined have a total of 394ha of industrial land, 74 ha (19 percent) of this land is vacant.
- Of the six identified industrial nodes, three are experiencing encroachment from other non-industrial uses; these are Mill Rd, Whakatane South, and the Whakatane Town Centre.
- The majority of this floorspace has been located within Kawerau (29 percent) followed by Mill Rd (23 percent). These two areas have the most sought after characteristics for industrial businesses.
- Industrial land is competing with non-industrial, higher use activities such as retail centres (eg the Hub).
- The Construction sector drove employment growth with an increase of 300 employees.
- Employment trends over the 2000-2005 period have shown minimal growth of 6 per cent in the industrial sector. It is important to recall that this growth rate was achieved during a time of high economic prosperity and employment growth throughout New Zealand.
- Employment in the industrial sector is approximately 35 per cent (in line with national figures including those for Tauranga).
- Of note is the decrease in Wood Processing employment of around 290 employees, negating employment growth in the fastest growing sector and demonstrating the reliance on the mills at Whakatane and Kawerau.
- Forecast employment for Whakatane and Kawerau sees minimal growth in industrial activity. The ILS forecast suggests that around 45 additional industrial workers will be employed in the study area by 2011, but that total employment would fall by 130 employees between 2011 and 2021. However, the Kawerau District Council indicated to BERL as part of this research, that it anticipates planned energy projects and the development of a new Industrial Zone in Kawerau will increase employment between 2013 and 2021. These factors were not included in the ILS in 2007.
- Although the ILS concluded that Manufacturing, Utilities, and Wholesale Trade were likely to be growth sectors, the Kawerau District Council's 2011 economic development strategy emphasises energy, wood processing, niche manufacturing and waste disposal/management as growth sectors.
- Land demand generated by industrial activity shows the need for an additional 2.7ha of land by 2011, falling to 1.7ha by 2021. This is significantly lower than the supply of vacant industrial land within the Whakatane and Kawerau District.

It is estimated in the LTP that a further 85ha of land is required to accommodate future growth in the District over the next 20 years (with an infill rate of 20 percent).

3.5.1 Residential Development

At present, Whakatane urban and coastal areas are undergoing a surge in residential and commercial development due, in part, due to the increasing number of people wishing to live, retire and holiday in coastal areas. In 2005, the potential (over a 15 year period) for residential land development in the Whakatane Urban areas indicated the following:

Table 3.5 Whakatane Residential Development 2005-2020

Area	Project Dwellings
Ohope	247 Dwellings
Coastlands/Piripai	682 Dwellings
Whakatane	200 Dwellings

3.5.2 Commercial Development

Whakatane has seen an increase in the number of bulk retail store developments in recent years (i.e. The Hub). The urban area is experiencing demand for larger floor retailing, which will increase with population growth in the area.

3.6 Flood protection

The low-lying parts of the Whakatane urban area have stop-banks as protection from flooding by the nearby Whakatane River. The river and stopbanks are managed by Environment Bay of Plenty. Through the town there are canals and open drains that link to pumps. The higher parts of the Whakatane urban area affect high volumes of stormwater to the reticulation in the lower areas of the town.

3.7 Planned infrastructure expenditure

The table below summarises the council's planned expenditure on infrastructure over the 10 year period between 2010 to 2019, by type and expenditure category (annual information by expenditure category was not located).

Table 3.6 Whakatane District Council planned expenditure, 2010-2019 (\$'000)

Whakatane District Council	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Transport											
Capex - Growth											10,000
Capex - Renewals											96,000
Capex - LOS											32,000
Total capex - Transport	6,000	11,000	8,000	12,000	9,000	13,000	25,000	19,000	11,000	20,000	134,000
Water supply											
Capex - Growth											3,650
Capex - Renewals											10,408
Capex - LOS											12,881
Total capex - Water supply	3,173	4,040	1,766	1,608	4,591	4,141	1,151	960	994	4,521	26,945
Wastewater											
Capex - Growth											2,686
Capex - Renewals											6,235
Capex - LOS											30,060
Total capex - Wastewater	2,687	7,323	4,047	2,252	6,134	6,317	1,923	2,922	1,471	1,004	36,080
Stormwater											
Capex - Growth											0
Capex - Renewals											2,839
Capex - LOS											8,778
Total capex - Stormwater	480	10	323	2,392	1,599	2,574	1,054	1,832	546	801	11,611

N.b. "LOS" = Level of Service

4 Kawerau

Kawerau is unique in that it possess a surplus of infrastructure capacity. The town has infrastructure in place to cater for a population of 15,000 people. Current population is approximately 7,000. The Council is also financially secure, with no debt, and is putting aside the funding required for asset replacement required in the future. The Council's planned investment in long-term asset renewals is set out below:

Table 4.1 Kawerau Long Term Asset Renewals

Financial Year	Transport Management (including Stormwater)	Water Supply	Wastewater
2019/20	\$300,000	\$1,054,000	\$8,000
2020/21	\$311,000	\$1,089,000	\$8,000
2021/22	\$323,000	\$483,000	\$3,000
2022/23	\$334,000	\$620,000	\$12,000
2023/24	\$1,639,000	\$539,000	\$2,616,000
2024/25	\$1,700,000	\$533,000	\$2,710,000
2025/26	\$1,761,000	\$2,474,000	\$2,991,000
2026/27	\$1,824,000	\$1,298,000	\$2,899,000
2027/28	\$1,890,000	\$1,526,000	\$3,012,000
2028/29	\$1,958,000	\$1,576,000	\$3,154,000
2029/30	\$2,029,000	\$1,628,000	\$3,263,000
2030/31	\$443,000	\$1,682,000	\$23,000
2031/32	\$459,000	\$3,207,000	\$1,838,000
2032/33	\$476,000	\$1,794,000	\$1,883,000
2033/34	\$1,519,000	\$711,000	\$1,882,000
2034/35	\$1,570,000	\$735,000	\$1,963,000
2035/36	\$1,630,000	\$2,834,000	\$2,028,000
2036/37	\$1,689,000	\$784,000	\$2,087,000
2037/38	\$1,747,000	\$3,828,000	\$2,469,000
2038/39	\$1,813,000	\$5,911,000	\$2,261,000

4.1 Transport and stormwater

There are 40kms of sealed road in Kawerau - and one kilometre of unsealed road. There has been some industry expansion identified in recent years which has created changes increased traffic flow. However, traffic counts suggest no significant net growth.

The District is experiencing zero to very low growth in demand for additional roading and stormwater services. Demand may increase if employment and activity rises following the development of planned energy projects and the new Industrial Zone in the District. If vacant sections were occupied, the existing roading and stormwater network would cope with additional demand. Stormwater from sources other than roads does not typically cause problems, as Kawerau District soils are very permeable and therefore stormwater infiltrates the ground rapidly.

4.2 Water

While official population projections indicate low growth in demand for additional water supply services in the Kawerau District, recent economic development initiatives may

increase demand as employment rises between 2013 and 2021.

Whilst there has been a modest increase in residential development, there remain a number of vacant sections in the town that have water supply available, but still have no buildings on them. Even if these sections were occupied, the existing water supply network would easily cope with additional demand. Growth is monitored on an on-going basis to determine any impending additional demand on water supply services.

Council has an asset replacement fund available for replacement of assets that fail in the future. However, population projections indicate that significant new assets are unlikely to be required. Small new assets are funded from depreciation reserves. There is no debt in relation to the Water Supply Activity.

The principal issue affecting Council's supply of potable water is that, in terms of biological cleanliness, the supply is not considered "secure" as defined by the Drinking Water Standards for New Zealand 2005 (DWSNZ 2005). An Ultraviolet treatment plant was installed in 2007 to rectify the historical irregular detection of low level faecal coliforms and potential protozoa in the source waters. The effectiveness of the plant has yet to be verified. The Council advised that it considers that current treatment and testing meets the DWSNZ 2005 standards.

4.3 Wastewater

Most households and businesses in the urban area of the Kawerau District are connected to Council's reticulated wastewater system. Less than 20 buildings are not connected and use septic tanks. The system collects wastewater from approximately 2,700 households and businesses only. Council has a trade waste bylaw prohibiting the use of the wastewater network as a method of disposing of industrial waste.

Kawerau has a new wastewater treatment plant that uses clarifiers, centrifuges and ground treatment of the final effluent, which was transferred to Council ownership in June 2009 from Carter Holt Harvey (CHH). The existing reticulation network has capacity to accommodate significant additional flows of wastewater. The Council advises that the treatment plant has the capacity to increase throughput by approximately 30 percent without further capital expenditure. Increasing the throughput to double the existing level could be accommodated by adding additional vessels to some parts of the existing plant. However, while the Kawerau District may see some growth in demand for additional wastewater services given its economic development initiatives, current growth predictions means there are no proposed new wastewater pipes in the Long Term Plan.

Any developer would be required to install appropriate wastewater systems then give their

ownership to Council. The renewal programme for wastewater infrastructure assets will meet current and future demands.

4.4 Land

Kawerau District is in the process of expanding the zoned land available for industrial/commercial activity in the town.

4.5 Flood protection

No issues exist with the provision of flood protection infrastructure due to free draining nature of the local soils.

4.6 Planned infrastructure expenditure

The table below summarises the council's planned expenditure on infrastructure over the 10 year period between 2010 to 2019, by type. Information on capital expenditure for growth and level of service was not identified.

Table 4.2 Kawerau District Council planned expenditure, 2010-2019 (\$'000)

Kawerau District Council	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Transport and Stormwater											
Capex - Growth											
Capex - Renewals	317	354	360	368	378	386	333	341	349	357	3,543
Capex - LOS											
Total capex - Transport and Stormwater	317	354	360	368	378	386	333	341	349	357	3,543
Water supply											
Capex - Growth											
Capex - Renewals	454	468	481	516	510	527	1,017	1,200	987	1,031	7,191
Capex - LOS											
Total capex - Water supply	454	468	481	516	510	527	1,017	1,200	987	1,031	7,191
Wastewater											
Capex - Growth											
Capex - Renewals	97	123	107	114	107	107	116	6	3	0	780
Capex - LOS											
Total capex - Wastewater	97	123	107	114	107	107	116	6	3	0	780

N.b. "LOS" = Level of Service

5 Opotiki

Due to a deliberate focus on reducing debt over the last few terms, Council is well placed to borrow to advance key capital projects at appropriate times over the next ten years. While Council has been able to advance its capital works programme for a number of years without borrowing, it proposes to significantly increase the capital works programme over the next ten years from \$2.3 million (currently) to an average of \$7.4 million per year. Projects that Council currently anticipates to fund through borrowing include the library upgrade, and the Sports and Events Centre. The ten year plan proposes that by 2019 Council's debt will have increased from \$3.1 million to \$7 million. Additional borrowing to implement the harbour resource consents would increase Council's debt to \$11.5 million. Both scenarios are well within Council's debt to revenue ratio policy. The average increase for the general rate will average 4.75 percent per annum over the ten years.

The urban area already has modern water and sewerage systems and the capacity to service the projected growth. This means Council is able to continue its programme of improving roads, including the sealing of rural roads, and provision of public toilet facilities, water supply upgrades, and improvements to Opotiki township sewerage reticulation.

The development of the Opotiki Harbour has been proposed for some time to support the development of aquaculture off shore. The resource consents for the harbour groynes have been lodged, the marine farm is now fully consented and steps to commercialise the space are currently underway. The community has indicated that this is a high priority outcome for the district and the Eastern Bay of Plenty.

5.1 Transport

The council is responsible for 314 km of rural roads and 26.7km of urban roads with 51 bridges throughout the district. Whilst urban roads are sealed, 187 km of rural road is unsealed. The summary replacement value of the district's roading assets, managed by the Council, inclusive of land is as follows:

Table 5.1 Opotiki Roading Asset values

Asset	Value (\$ million)
Rural roads	111.3
Bridges	14.5
Rural street lights	0.01
Urban roads	17.6
Footpaths	2.0
Urban street lights	0.51
Replacement Value	145.9

With the projected population growth for the district, it is currently believed that the services offered in this activity will be sufficient to meet the needs of the community.

The main transport issues facing the district are the increasing number of logging trucks (a safety issue on both the highway and on local roads, asset damage and dust nuisance on unsealed rural roads) and the demand for sealing the unsealed road surfaces. State Highway 2 and State Highway 35 are critical for the District's transport. These roads are managed by The New Zealand Transport Authority (NZTA).

Council is currently seeking to improve transportation by investigating the possibility of a domestic sea freight service. Preliminary research has identified key existing and potential new industries that could benefit from a domestic sea freight service in place.

5.2 Water

A reticulated water supply is provided to 5,760 people in Te Kaha, Ohiwa, Opotiki, Hikutaia and Waiotahi Drifts. This includes 102.9kms water reticulation pipes 6 pump stations.

Table 5.2 Opotiki Water Asset Values

Scheme	Replacement Value	Fair Value (June 2008)
Opotiki	\$14,440,000	\$3,521,000
TeKaha	\$869,300	\$525,000
Ohiwa	\$110,400	\$81,000

New regulations have been introduced requiring Council to seek alternative supply options. The Opotiki/Hikutaia supplies have sufficient capacity to meet the expected population predictions in the Ten Year Plan. Council is preparing to source its water from two new bores and has set aside \$200,000 for pipe work to link to the main supply. This will provide capacity to supply 4,500 m² / day in Opotiki whilst demand is currently only 1,500 m² day. Similarly, the Te Kaha supply has sufficient source capacity both within the existing supply area and for additional expansion. The Ohiwa supply cannot cater for new growth without upgrading works.

The Ministry of Health operates a Drinking Water Assistance Programme to help those communities with limited funds to upgrade their supplies. A public risk management plan for the Te Kaha supply has been prepared and given that the ministry's assistance programmes are currently available, treatment upgrade works planned for 2010/2011 will be moved forward to 2009/2010. The upgrade works will cost \$230,000.

5.3 Wastewater

5.3.1 Sewerage

Council operates two schemes that receive, treat and discharge sewage effluent. One scheme serves the township of Opotiki and the Waitotahi Drifts while the other serves a small subdivision at Waihau Bay. Both schemes discharge primary treated effluent to field soakage systems. All other dwellings in the district are serviced by septic tank systems.

Table 5.3 Opotiki Wastewater Asset Values

Sewerage Scheme	Replacement Value	Fair Value (June 2008)
Opotiki	\$6,981,000	\$3,521,000
Waihau Bay	\$244,000	\$176,000

Future demand and strategic issues include:

- There are some parts of the Opotiki sewerage reticulation that need upgrading to overcome stormwater infiltration during wet weather. It is planned to implement this upgrade over 5 years from 2009/10.
- For the Opotiki Scheme the reticulation can accommodate a 5 percent to 10 percent increase in population with minor modifications. This is basically the infilling of empty sections in town. Anything above this will require new reticulation and new pump stations. The treatment plant has been designed for an increase of 25 percent in population.
- A reduction of infiltration in to exiting reticulation will also increase capacity.
- For the Waihau Bay scheme the asset is not designed for more than the present 26 sections it currently services, nor will present Resource Consents allow this.

5.4 Stormwater

Council provides a storm water drainage system in the Opotiki township and at the Waitotahi Drifts subdivision along with a flood protection system for buildings, roads and properties in the Opotiki Township. Environment Bay of Plenty is responsible for the provision and operation of flood protection for the Opotiki township and environs.

Table 5.4 Opotiki Stormwater Asset Values

Asset	Replacement Value	Fair Value (June 2008)
Opotiki	\$1,519,500	\$1,058,600

Future demand and strategic issues include:

- Capacity is such that a 20 percent increase in building within the Opotiki township is unlikely to impact greatly on the present capacity of the stormwater system.
- In times of prolonged, heavy rainfall, in both the Otara and Waioeka River headwaters and the Opotiki township, and when the river levels rise such that the Environment BoP stop-bank floodgates close, the township can no longer discharge stormwater. Reliance is then placed on the pump stations. If a power outage was to occur at this time, the pump stations would cease to function and water would pond until mobile power generation could be established. Opotiki township has designated ponding areas for this occurrence. The Council will be regularly assessing climate change/sea level rise reports to address needs/upgrades for future years.

5.5 Planned infrastructure expenditure

The table below summarises the council's planned expenditure on infrastructure over the 10 year period between 2010 to 2019, by type and expenditure category. Information on capital expenditure for growth and level of service is not separately identified.

Table 5.5 Opotiki District Council planned expenditure, 2010-2019 (\$'000)

Opotiki District Council	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Transport											
Capex - Renewals	595	631	656	675	691	707	723	739	757	775	6,949
Capex - Enhancements	392	477	504	622	474	645	513	673	516	608	5,424
Total capex - Transport	987	1,108	1,160	1,297	1,165	1,352	1,236	1,412	1,273	1,383	12,373
Water supply											
Capex - Renewals	32	19	11	9	72	16	108	68	32	57	424
Capex - Enhancements	230	171	0	99	97	93	0	0	0	0	690
Total capex - Water supply	262	190	11	108	169	109	108	68	32	57	1,114
Wastewater											
Capex - Renewals	490	80	494	71	303	11	8	13	0	56	1,526
Capex - Enhancements											
Total capex - Wastewater	490	80	494	71	303	11	8	13	0	56	1,526
Stormwater											
Capex - Renewals	8	0	0	12	0	0	7	0	54	0	81
Capex - Enhancements	100	31	32	88	0	0	84	0	0	0	335
Total capex - Stormwater	108	31	32	100	0	0	91	0	54	0	416

N.b. "LOS" = Level of Service

6 Rotorua

Rotorua District Council's main physical infrastructural assets are listed and valued in Table 6.1

Table 6.1 Rotorua DC Key Infrastructural Assets

Asset	Cost (\$ million)	Accumulated Depreciation (\$ million)	Book Value July 2008 (\$ million)
Bridges	13.1	0.7	12.4
Footpaths	26.3	1.4	24.9
Parking	0.9	0.2	0.7
Roading	231.1	11.7	219.4
Street Signal. Sign & Light	5.0	0.9	4.0
Land	11.4	0.0	11.4
Stormwater drainage	60.1	3.1	57.1
Wastewater Reticulation	114.5	7.8	106.8
Wastewater Treatment Plant	41.6	4.5	37.0
Water Works	76.6	4.2	72.3
Total	580.5	34.5	545.9

6.1 Transport

Rotorua's key local road network assets are as follows;

- 824km of sealed roads and 179km of unsealed roads
- 96 bridges and footbridges
- 5.5kms of shared path ('share with care') cycleways
- 17.5kms of State Highway cycle lanes
- 392.4km of footpaths 6,690 streetlights numerous road signs, traffic signals and marker posts
- 124 bus shelters.

Major road upgrade projects allowed for in the Ten Year Plan include:

- Victoria Street Arterial
- Lake Road 4-Laning
- Eastern Arterial
- Ngongotaha/Fairy Springs Road 4-Laning

The Victoria Street arterial will provide a new route from Old Taupo Road through to Te Ngae Road, eliminating the need to use parts of Amohau Street (StateHighway35).

Although outside the time frame of this Ten Year Plan, it is proposed to transfer responsibility

for Amohau Street to Rotorua District Council and Victoria Street to the state highway road network.

6.2 Water

Rotorua's key water supply assets include:

- 9 sources
- 16 pump stations
- 22 reservoirs
- 24,000 connections
- 688km of pipe work

The Central Urban Water Supply serves a population of 38,960 with an estimated 16,091 connections covering an area of 2,600hectares. An average of 24,291m³ was used daily in 2008, with estimated peak day consumption of 34,904m³.

The Eastern Area Water Supply is a predominantly urban supply serving a population of 9,616 with 3,913 total connections including 327 industrial or commercial connections covering an area of 1,900 hectares. An average of 4,185m³ was used daily in 2008, with a estimated peak day consumption of 6,087m³.

Originally a predominantly urban supply the Ngongotaha Water Supply services Ngongotaha and some of the adjoining farmlands. The supply services a population of 4,382 with 1,996 total connections including 332 industrial/ commercial connections. An average of 2,486m³ was used daily in 2008 with a peak consumption of 3,580m³,

Council will provide a supply of drinking water which is safe in areas where it is cost-effective. The commercial/industrial sector (including dairy farming) also expects council to ensure there is adequate water provided. Council has indicated in the LTP that it will ensured that these services will be available to areas of the district in which growth and development is expected.

The LTP specifies the levels of service that the Council will endeavour to maintain within the Water Supply Area. The stated minimum levels of service for flow and pressure are not achievable for every single connection at all times. Council's aim is that at least 95 percent of connections will meet these levels under normal demand.

6.3 Wastewater

RDC's wastewater activity comprises the collection, treatment and disposal of wastewater treatment and disposal of wastewater from the three urban areas of Rotorua (Ngongotaha,

city and eastern suburbs) as well as identified rural lakeside communities (at present Mourea, Marama Point and Okawa Bay/Duxton Hotel).

The serviced area is programmed to be extended to include Brunswick, Rotokawa, Okareka, Okere, Otaramarae, Whangamarino, Tarawera, Hamurana, Gisborne Point/Hinehopu, Rotoma and Mamaku

The Rotorua Basin Wastewater Strategic Plan identifies around \$45 million of capital expenditure for upgrade work over a 50 year period. Of this, approximately \$21million is included in the Ten Year Plan, and the remainder is for projects that will take place after 2018/19.

These major projects are included in the Ten Year Plan:

- \$12.5 million over 2008/2009 and 2009/2010 for Brunswick/Rotokawa sewage collection and transfer to the Wastewater Treatment Plant.
- \$9.7 million over 2008/2009 to 2010/2011 for the Lake Okareka Sewerage Scheme.
- \$14.7 million over 2008/2009 to 2011/2012 for the Okere/Otaramarae/Whangamarino Sewerage Scheme.
- \$11.9 million over 2008/2009 to 2012/2013 for the Gisborne Point/Hinehopu Sewerage Scheme.
- \$15.0 million over 2008/2009 to 2012/2013 for the Hamurana/Awahou Sewerage Scheme.
- \$13.8 million over 2012/2013 to 2014/2015 for the Lake Tarawera Sewerage Scheme.
- \$12.4 million over 2011/2012 to 2012/2013 for the Lake Rotoma Sewerage Scheme.
- \$6.0 million from 2014/2015 to 2016/17 for the Mamaku Sewerage Scheme.
- \$1.84 million from 2008/2009 to 2010/2011 for the sewerage of unserved parts within the Urban Sewerage Area.
- \$6.60 million from 2008/2009 to 2011/2012 for the upgrade of the Wastewater Treatment Plant.
- \$5.30 million from 2010/2011 to 2016/2017 for the upgrade of the Land Treatment System.
- \$8.23 million from 2008/2009 to 2018/2019 for the upgrade of the Urban Sewer Reticulation Network.

The levels of service which Council will endeavour to maintain within the Wastewater Service Area Include:

- Every serviceable property is entitled to a single 100 mm diameter wastewater connection to the boundary of the property.

- Council will maintain the sewer system in a state that will enable domestic type sewage to be carried away and treated by the system without blockages.
- Serviceable properties are those properties with some part of the land within 30 metres or the building within 60 metres of a public sewer main and are capable of being effectively connected, either directly or through a private drain. These properties, if not connected to the public sewer, are required to pay an availability charge.
- There are several areas within Rotorua Urban where service is not available. Council has budgeted to progressively service these areas over eight years from 2005/06.
- Council will treat all sewage discharged into its system in accordance with its Resource Consents

The Rotorua Urban Waste Water Scheme has historically been self-funding, with all costs and revenues identified in a separate stand-alone account.

6.4 Stormwater

The stormwater network consists of:

- 450m of lined channel
- 87.9km of open channels
- 742m of overland flowpaths
- 230.4km of piped networks
- 2 pump stations
- 3 flood detention dam

Stormwater is an area where there has been some lag in RDC's asset investment over recent years. A detailed plan is being developed that will set out the amount and size of stormwater works needing to be built in various parts of Rotorua.

RDC will continue with its backlog and upgrade expenditure in stormwater infrastructure which is intended to reduce the risk of flooding from 1 in 100 year storm events. A continuation of the capital upgrade programme to address a backlog in the urban network is included in the Ten Year Plan. No significant changes to levels of service as proposed.

6.4.1 Rotorua Lakes Water Quality

The most important environmental issue facing Rotorua District is that of lake water quality of the district's 14 Lakes. There has been significant scientific investment in understanding the cause of the decline of lake water quality of many Rotorua lakes, and into the potential solutions.

Environment Bay of Plenty, Rotorua District Council and Te Arawa Lakes Trust have worked

collaboratively to develop an understanding of the scientific issues, to implement initiatives for improving lake water quality, and to monitor the effectiveness of investment.

The Government, through the Ministry of the Environment, has also played a major role in assisting with funding. In 2008 the ministry announced a \$72 million contribution towards restoration strategies. Council is building sewerage schemes for lakeshore communities that currently rely on septic tanks, which adversely affect lake water quality by releasing nutrients into groundwater which ultimately reaches the lakes.

Plans have so far been concluded for the four priority lakes: Rotorua, Okareka, Rotoiti and Rotoehu. Council has already completed lakeshore community sewerage schemes for Mourea, Marama Point and Okawa Bay/Duxton Hotel and these were commissioned in 2006. Water quality in the Okawa Bay area of Lake Rotoiti is now showing encouraging signs of improvement.

6.5 Planned infrastructure expenditure

The table below summarises the council's planned expenditure on infrastructure over the 10 year period between 2010 to 2019, by type and expenditure category. Planned capital expenditure to deal with a "backlog" of infrastructure investment has been included in the renewals category for consistency of reporting with the other territorial authorities.

Table 6.2 Rotorua District Council planned expenditure, 2010-2019 (\$'000)

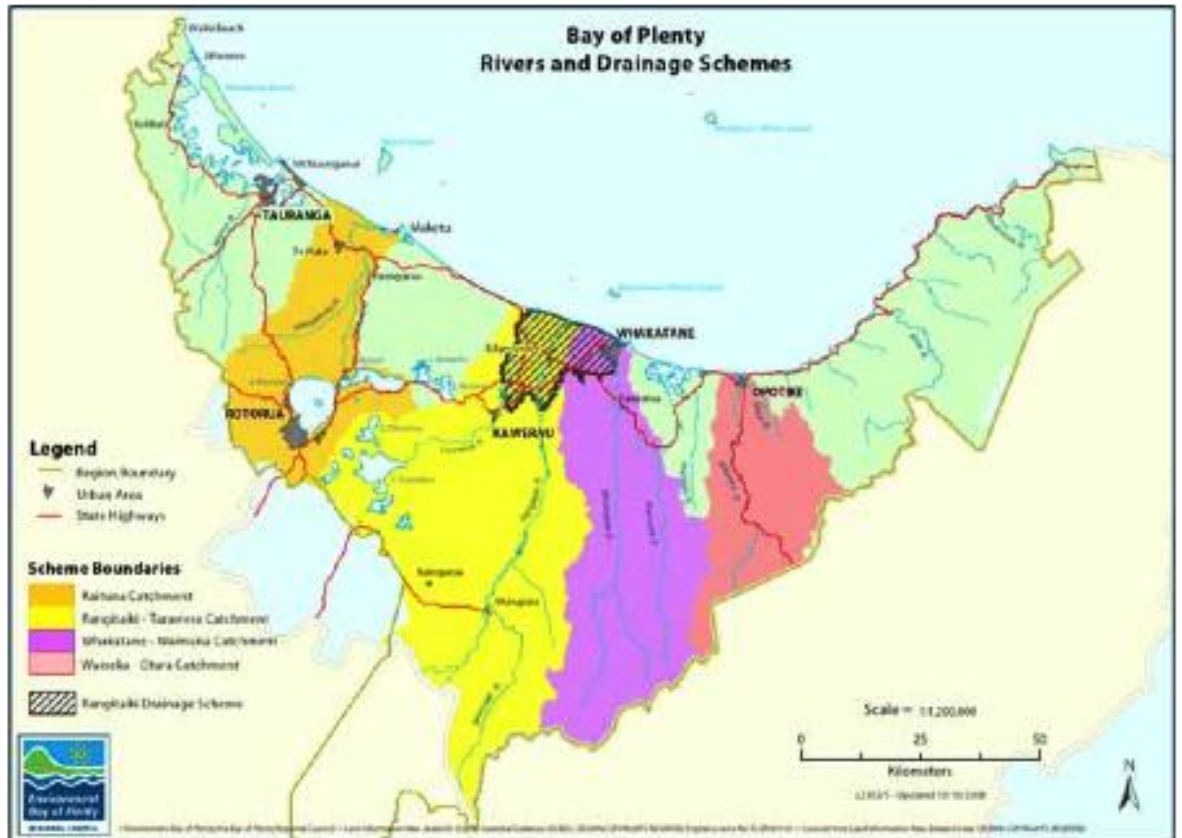
Rotorua District Council	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Transport											
Capex - Growth	1,443	8,449	3,209	1,900	811	25,088	12,445	9,818	4,537	908	68,608
Capex - Renewals	4,910	4,861	5,002	5,122	5,240	5,355	5,478	5,610	5,744	5,871	53,193
Capex - LOS	2,826	2,393	2,675	2,522	2,380	2,637	4,437	2,762	2,828	2,891	28,351
Total capex - Transport	9,179	15,703	10,886	9,544	8,431	33,080	22,360	18,190	13,109	9,670	150,152
Water supply											
Capex - Growth	2,469	1,048	877	1,187	1,311	278	108	112	115	119	7,624
Capex - Renewals	5,199	4,002	2,749	1,520	1,562	1,509	1,201	1,362	1,087	1,149	21,340
Capex - LOS	33	0	0	0	0	0	0	0	0	0	33
Total capex - Water supply	7,701	5,050	3,626	2,707	2,873	1,787	1,309	1,474	1,202	1,268	28,997
Wastewater											
Capex - Growth	14,421	21,331	17,472	17,957	21,510	7,010	606	3,339	3,890		107,536
Capex - Renewals	2,865	4,805	2,445	2,206	6,015	1,508	2,146	3,520	5,621	6,632	37,763
Capex - LOS	0	0	0	0	0	0	0	0	0	0	0
Total capex - Wastewater	17,286	26,136	19,917	20,163	27,525	8,518	2,752	6,859	9,511	6,632	145,299
Stormwater											
Capex - Growth	158	101	104	107	110	113	117	120	124	128	1,182
Capex - Renewals	1,131	918	945	973	1,003	1,034	1,064	1,096	1,129	1,162	10,455
Capex - LOS	0	0	0	0	0	0	0	0	0	0	0
Total capex - Stormwater	1,289	1,019	1,049	1,080	1,113	1,147	1,181	1,216	1,253	1,290	11,637

N.b. "LOS" = Level of Service

7 Bay of Plenty Regional Council

The Regional Council is responsible for the provision of flood protection infrastructure across the region. The map below identifies the region's river catchments and associated flood protection schemes:

Figure 7.1 Bay of Plenty River Catchments



7.1 Flood protection assets

Current valuations indicate an overall value (at replacement cost) for the region's flood protection assets of \$190 million. The table below provides a breakdown of assets and values:

Table 7.1 BOPRC Flood Protection Asset Values by Catchment

Scheme	Value (\$ million)
Kaituna	43.4
Rangitaiki-Tarawera	58.5
Waioeka-Otara	27.74
Whakatane-Waimana	46.4
Rangitaiki Drainage	14.0
Replacement Value	190.1

Table 7.2 BOPRC Flood Protection Asset Values by Asset Type

Asset	Value (\$ million)
Erosion Protection	24.5
Pump Stations	7.0
Stopbanks	136.6
Structures	21.9
Waterways	13.4
Replacement Value	190.1

7.1.1 Key issues and bottlenecks

The key flood protections issues identified by the Regional Council are set out below, alongside the proposed mitigation strategies.

Table 7.3 Flood Protection Issues

Issue	Mitigation
Sea level rise	Some provision included in some schemes
Increased frequency and magnitude of flooding due to climate change	No current policy or provision
Interdecadal Pacific Oscillation	To be considered in any future review of flood protection assets
Stock damage to stopbanks	Monitoring to assess condition
Stopbank alignment – too close to river channel increasing risk of undermining	Additional edge protection works Maintenance of existing edge protection works and buffer zones
Stockbank narrowness in some rural locations	CCTV inspection
Aggradation of river bed through the natural movement of river metal	Monitoring
Degradation of river beds through extraction of river metal	Regulatory controls and monitoring
Water takes for irrigation purposes	Regulatory controls and monitoring
Increased requirement to waterways for recreational purposes	Identify and develop existing and potential access points

7.1.2 Compliance

The Rivers and Drainage Asset Management Plan indicates that at present the Council is achieving 100 per cent compliance with the Rivers and Drainage Levels of Service, Performance Measures and Reporting as set out in the Plan.

7.2 Asset maintenance and renewals

Currently, it is projected that the cost of asset maintenance for the five schemes is projected to be \$50 million during the next 10 years and approximately \$51 million for each 10-year period for the following 40 years. This is within the parameters of the Council's financial planning.

Capital expenditure on the schemes is projected to be \$27 million during the next 10 years, and approximately \$10 million for each 10-year period for the following 40 years. Again, this is funded (within the current Ten Year Plan).

The Rivers and Drainage Asset Management Plan assumes asset maintenance and capital works are funded 80% from targeted scheme ratepayers and 20% from general funds. The Rangitaiki Drainage Scheme is funded 100% by targeted ratepayers.

The Plan acknowledges that in where there is growth in population, or there are areas that are growing due to new residential or business developments, this is likely to create greater demand in two areas:

- firstly, for the provision of protection from waterways in times high flows and
- secondly, for greater and easier access to waterways for recreational and conservation use.

Furthermore, the demand for Rivers and Drainage infrastructure, protection works and facilities can be influenced by growth, changes in trends, climate, seasonal fluctuations and changes in demographics etc. (e.g. people place a greater demand on land utilisation and/or become interested in recreational activities based around water ways).

To keep pace with the projected growth and demand drivers a ten year capital works and renewals programmes (costing \$22 million) have been adopted by the Regional Council. The table below summarises the projects related to growth and demand over the next 10 years:

Table 7.4 Capital Works – Growth and Demand Summary

Works Related to Growth and Demand	Cost	Scheme	Completion
Bell Road Pump Station	\$2.10m	Kaituna	2010
Ford Road Gravity Culvert	\$0.25m	Kaituna	2011
Raparapahoe Stopbank Renewal	\$0.63m	Kaituna	2011
Waioho Stopbank Renewals	\$0.70m	Whakatane	2011
Te Rahu Drain Seepage	\$0.25m	Whakatane	2012
Waioeka and Otara Stopbank Renewals	\$0.72m	Waioeka	2012
Ford Road Pump Station	\$1.25m	Kaituna	2013
Te Rahu Canal Stopbank Renewals	\$0.20m	Whakatane	2013
Edgecumbe Flood Mitigation	\$9.90m	Rangitaiki	2014
Okere Gates Lifting Mechanism Renewal	\$0.14m	Kaituna	2015
Te Teko School Stopbank	\$0.10m	Rangitaiki	2015
Kaituna Stopbank Renewals	\$2.69m	Kaitun	2016
Tarawera Stopbank Renewals	\$1.20m	Rangitaiki	2016
Whakatane River Stopbank Renewals	\$0.60m	Whakatane	2016
Rangitaiki Stopbank Renewals	\$1.03m	Rangitaiki	2018
Culvert Renewals	\$0.28m	Rangitaiki	2019

7.3 Planned infrastructure expenditure

Based on the information contained in the Regional Council's Rivers and Drainage Asset Management Plan it is concluded that there are no obvious deficiencies or gaps in the provisions of flood protection infrastructure in the Bay of Plenty, assuming current growth levels and climatic conditions persist.

Table 7.5 BOPRC planned expenditure, 2010-2019 (\$'000)

BOPRC	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Flood Protection											
Flood mitigation	0	0	0	1,250	0	0	0	0	0	0	1,250
Culvert and drains	0	250	0	0	0	100	1,200	0	0	0	1,550
Pump station	2,100	630	0	0	0	0	0	0	0	0	2,730
Stopbank	0	700	970	200	9,900	140	3,290	0	1,030	280	16,510
Capex - Growth	2,100	0	0	0	0	0	0	0	0	0	2,100
Capex - Renewals	0	1,580	970	1,450	0	140	4,490	0	1,030	280	9,940
Capex - LOS	0	0	0	9,900	100	0	0	0	0	0	10,000
Total capex - Flood Protection	2,100	1,580	970	11,350	100	140	4,490	0	1,030	280	22,040

All work is done, and services rendered at the request of, and for the purposes of the client only. Neither BERL nor any of its employees accepts any responsibility on any grounds whatsoever, including negligence, to any other person.

While every effort is made by BERL to ensure that the information, opinions and forecasts provided to the client are accurate and reliable, BERL shall not be liable for any adverse consequences of the client's decisions made in reliance of any report provided by BERL, nor shall BERL be held to have given or implied any warranty as to whether any report provided by BERL will assist in the performance of the client's functions.