

Infrastructure Strategy

1. Introduction

Council owns a wide range of assets, including land and buildings, motor vehicles and plant. Infrastructure assets held by council are flood and drainage scheme assets and these are operated and maintained by council. Their book value is around \$60 million, representing approximately 71% of the value of total assets held.

This strategy focuses on our infrastructure assets, which are made up primarily of hundreds of kilometres of floodbanks, drains, pump stations, and culverts.

Flood protection and drainage assets are grouped into “schemes”. All our schemes have infrastructure in place, and we want to ensure that the infrastructure will provide to their communities the agreed levels of service.

The Leith Flood Protection Scheme is currently being constructed, and there are significant capital costs associated with this work. We plan to complete this scheme by 2019/20.

The purpose of this strategy is to identify how we will manage our infrastructure assets, identify significant issues around our flood protection and drainage schemes over the next 30 years through to 2045, and discuss how we will address those issues. We have made many assumptions in determining our strategic direction for the 30 year period and these are also discussed in this strategy.

2. Geographical context

Large developed areas of Otago are in low lying river flats, often close to sea level. Many people live in those areas, and farming is a key use of the land. The continued safe occupation and use of these areas is important to the wellbeing of its communities, and so protection from flooding is important. Our flood protection schemes aim to protect people and property from flooding. Our drainage schemes assist maintaining the productive capability of the land.

We manage eight flood and drainage schemes, protecting both the urban and rural sectors within the Dunedin city boundary, Central Otago District, Clutha District and the Queenstown Lakes District. Those schemes are as follows:

- Alexandra flood protection scheme
- Leith flood protection scheme (under construction)
- Lower Clutha flood and drainage scheme
- Lower Taieri flood protection scheme
- East Taieri drainage scheme
- West Taieri drainage scheme
- Tokomariro drainage scheme
- Shotover Delta flood protection

3. Capital Expenditure

There are three drivers for making capital investment in our flood and drainage schemes and they are:

- The need to renew / replace existing assets
- The need for an increase in the level of service that the schemes currently provide
- The requirement to meet a new need or demand for flood or drainage scheme protection.

3.1 Renew / replace

All assets are appropriately maintained, however, some assets will still need to be renewed / replaced at the end of their useful lives. The types of assets that have a programme of renewal / replacement include:

- Assets associated with pump stations
- Floodbanks
- Bridges, culverts, pipes and other structures

Floodbanks are reconstructed to improve their resilience.

The renewals/replacement programme for each of the schemes is based on the assumptions that:

- there will be no deferred maintenance during the 30 year period.
- there will be no events (flood, earthquake etc.,) of a magnitude that will damage the assets.

The majority of the capital work expected to be undertaken by council over the next 30 years will be the renewal/replacement of assets, as our schemes are well established.

3.2 Increase levels of service

We define levels of service as the level of protection our flood and drainage schemes provide. These may be expressed in terms of the return period of a flood, e.g., the 1 in 100 year flood, or in terms of the ability of our pumps to remove water from drains. Council may decide to increase the level of service for the following reasons:

- the community may demand a greater level of flood protection or drainage, than is currently being provided
- a need for a greater level of environmental protection
- because of climate change effects.

With the exception of the construction of the new Leith Flood Protection Scheme, the current levels of service provided by council for all flood and drainage schemes in relation to flood protection and drainage standards have not been revisited by council or the affected communities for a number of years. Council will go out to those communities in around 2019/20, with information about the current levels of service, so that it can have a discussion about whether or not there is a desire to increase those levels of service, and if so, the possible options for doing so.

Recent changes to council's Regional Plan Water around water quality, means that the water coming out of council's drainage schemes into rivers and lakes must meet certain standards by 2020. In 2015/16 council needs to decide on how it will comply with the water quality rules. It will investigate options for improving the quality of water discharged at scheme pump stations, and implement the preferred option(s) over the following two years. This environmental requirement for improved water quality may require some capital expenditure, which we think will improve the level of service in terms of environmental protection for those affected schemes and these have been provided for.

Studies have shown that there will be a possible sea level rise of between 0.3 and 0.5 metres over the next 30 years. Sea level rise may generate additional flooding and drainage risks, particularly for the Taieri and Lower Clutha flood and drainage schemes, which are close to sea level. Council will investigate the effects of sea level rise on agreed levels of service. We believe capital works may be required to mitigate that risk, so that we continue to maintain and provide the agreed levels of service. Investigation works have been budgeted for, and once known, capital budgets will be prepared for any works needed.

As we cannot predict if or when flood or earthquake events may occur, or that they might result in damage to scheme assets, the capital level of service programmes for each of the schemes in this strategy do not include such events taking place. However, the likelihood of such an event occurring during the 30 year period is high, and so there is a risk as to the accuracy of our financial estimates.

While our schemes are designed to deal with flood events, we are not prepared for events that will be greater than the levels of service provided. For example, the Leith scheme is being designed to provide protection for a 1 in 100 year flood; we will not be prepared for a flood event of a greater magnitude than this.

3.3 New need or demand

There is a possibility that new schemes may need to be developed in areas where currently no flood protection or drainage services are provided. This demand may be triggered by a flood event, or increase in activity in a flood prone area. Council may take undertake investigations to determine the feasibility during the 30 year period, if there is a demand for possible new schemes.

Demand is managed through working collaboratively with our territorial authorities to manage land use activities in our flood prone areas.

The capital estimates assume that there will be no new schemes developed over the 30 year period.

4. Operational Expenditure

Operational expenditure covers the maintenance and operation works associated with each scheme, and includes depreciation and the day to day running costs.

Council has operational and maintenance plans in place, and these set out the maintenance requirements of each type of asset.

5. Our Priorities

Council's priorities for our future flood and drainage scheme activities include the following:

- Providing agreed levels of flood and drainage protection to our communities
- Identifying and remedying assets where levels of service are not being achieved, or there is a high likelihood of failure.
- Complying with water quality standards by 2020
- Identifying and addressing potential issues arising from expected sea level change
- Continuing to develop our asset management plans for each scheme,

These priorities will assist our future planning and decision making processes

6. Assumptions

6.1 Future population

We do not expect that, because of population growth there will be any significant increase in the demand on our flood protection and drainage scheme assets. These assets are not directly impacted by the population levels within the scheme areas. Further, we assume that based on prior years, our population growth in this region will not be significant over the next 30 years.

6.2 Inflation

The financial forecasts for the forecasts for the first 10 years of this strategy are adjusted for projected inflation based on the BERL local government cost index. The forecasts for year 11 to 30 have been inflated to year 10 costs, that is, no further inflation allowance has been added.

6.3 Useful lives

The renewal / replacement programme is based on the useful life of each asset. Useful lives are assumed to be in accordance with Council's accounting policies.

6.4 Levels of Service

We are assuming that there will be no changes to the levels of service for each of our flood and drainage scheme, except for the construction of the Leith scheme, and for improvements to the quality of water going through our drainage schemes.

6.5 Other assumptions

Other assumptions made in preparing this strategy are as follows:

- There will be no new schemes developed over the 30 year period.
- There will be no deferred maintenance during the 30 year period.
- There will be no major flood or earthquake events during the period, that will result in damage to scheme assets.

7. Most Likely Scenarios and their cost

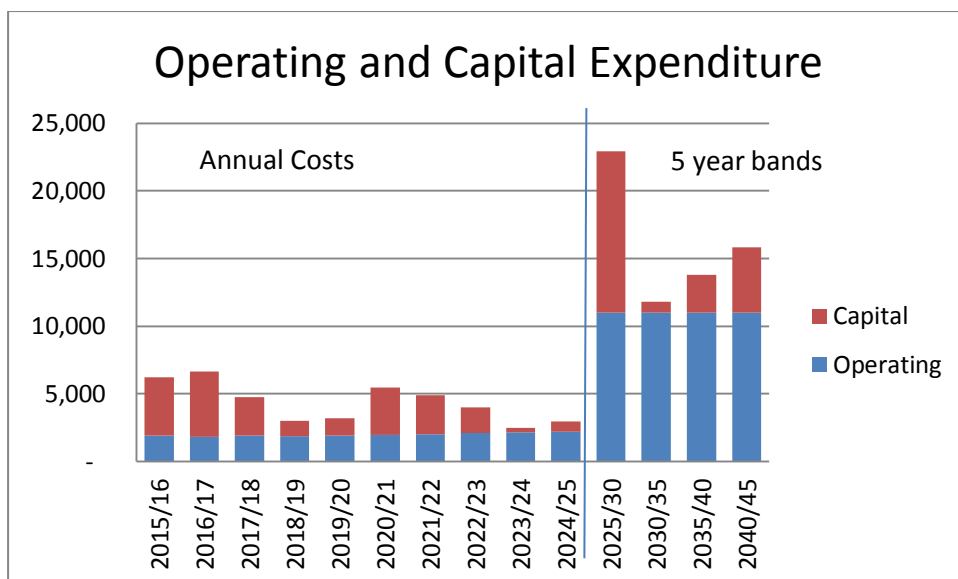
The following sections outline the most likely scenarios for council infrastructure investment in our scheme areas. The scenarios are based around the expected useful lives of the assets, and when they will require replacement.

The significant investment is driven by our priority to provide agreed levels of service throughout the 30 year period of this strategy.

The total projected operating expenditure over the next 30 years is \$112 million

The total projected capital expenditure over the next 30 years is \$47 million.

The annual operating and capital expenditure is as follows:



Capital and Operating Expenditure by Scheme

Alexandra Flood Protection

Over the first two years of the plan, council will be assessing the condition and structural integrity of scheme floodbanks, for flood hazard risk. This may result in a need for capital expenditure not yet provided for. Work planned for the Alexandra Flood Protection Scheme includes:

	Capital	Operating
2015/16		
• Irrigation system upgrade – stage 1	\$25,000	
• Operating expenditure		\$249,000
2016/17		
• Irrigation system upgrade – stage 2	\$26,000	
• Operating expenditure		\$180,000
2017/18		
• Irrigation system upgrade – stage 3	\$26,000	
• Operating expenditure		\$199,000

For the last seven years of the plan, no capital expenditure has been identified as being required. Operating expenditure for each of those years is shown below:

2018/19	\$153,000
2019/20	\$157,000
2020/21	\$171,000
2021/22	\$175,000
2022/23	\$179,000
2023/24	\$183,000
2024/25	\$187,000

2025/30

Operating expenditure	\$935,000
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2030/35		
• Replace 3 pump stations electrical systems, structure etc.	\$730,000	
• Flood bank protection works	\$112,000	
• Operating expenditure		\$935,000
2035/40		
Operating expenditure		\$935,000
2040/45		
• Pump station replacement	\$1,705,000	
• Operating expenditure		\$935,000
Total Estimated Cost of Works	\$2,547,000	\$5,573,000
Leith Flood Protection		
	Capital	Operating
2015/25		
Complete construction of flood protection works for period 2015/16 to 2019/20 as follows:		
2015/16		
• Dundas Street to St David Street	\$4,514,000	
• Operating expenditure		\$403,000
2016/17		
• Union Street to Leith Street	\$4,584,000	
• Operating expenditure		\$507,000
2017/18		
• Dundas Street Bridge	\$2,281,000	
• Operating expenditure		\$579,000
2018/19		
• Forth Street to Harbour	\$448,000	
• Operating expenditure		\$590,000
2019/20		
• Enhancement works Forth Street to Harbour	\$460,000	
• Operating expenditure		\$603,000
For the last five years of the plan, no capital expenditure has been identified as being required. Operating expenditure for each of those years is shown below:		
2020/21		\$611,000
2021/22		\$614,000
2022/23		\$618,000
2023/24		\$620,000
2024/25		\$623,000
2025/30		
• Bank protection works	\$487,000	
• In channel structures, including weirs, etc.	\$1,218,000	
• Operating expenditure		\$3,115,000

2030/35		
• Operating expenditure		\$3,115,000
2035/40		
• Bank protection works	\$195,000	
• Operating expenditure		\$3,115,000
2040/45		
• Bank protection works, bunds etc.	\$209,000	
• In channel structures, including weirs, debris traps etc.	\$70,000	
• Operating expenditure		\$3,115,000
Total Estimated Cost of Works	\$14,466,000	\$18,228,000

Lower Clutha Flood & Drainage

Capital and operating expenditure for the next 30 years is shown below. Changes to capital expenditure may be incurred following planned investigations as follows:

- Over the first two years of the plan, council will be assessing the condition and structural integrity of scheme floodbanks. Improvements to floodbanks has been programmed in over the 30 year period, but may be amended, depending on the results of the assessment.
- In 2015/16, council will be assessing the effects and implications of shoreline retreat and sea level rise. This may result in the need for capital works not currently provided for.
- In 2017/18 council will be discussing levels of service with the Lower Clutha community, which may result in changes to the current levels provided.

	Capital	Operating
2015/16		
• Culvert and bridge upgrades	\$54,000	
• Alter drainage structure at Lake Tuakitoto/Robson Lagoon	\$112,000	
• Improve pump station safety	\$92,000	
• Operating expenditure		\$1,216,000
2016/17		
• Culvert and bridge upgrades	\$55,000	
• Alter drainage structure at Lake Tuakitoto/Robson Lagoon	\$20,000	
• Improve pump station safety	\$45,000	
• Improvement in water quality discharges	\$174,000	
• Improve availability of pump information for community access	\$175,000	
• Operating expenditure		\$1,214,000
2017/18		
• Culvert and bridge upgrades	\$26,000	
• Improvement in water quality discharges	\$166,000	
• Paratei floodbank improvements to reduce risk of failure	\$219,000	
• Floodbank at Factory Road improvements, protect against erosion	\$324,000	
• Operating expenditure		\$1,088,000
2018/19		
• Culvert and bridge upgrades	\$27,000	

• Kaitangata pump modifications – upgrade of parts	\$247,000	
• Refurbish Rutherford Locks –outfall structure	\$25,000	
• Barnego pump modifications – design works	\$7,000	
• Operating expenditure		\$1,068,000
2019/20		
• Culvert and bridge upgrades	\$27,000	
• Refurbish Rutherford Locks – outfall structure	\$23,000	
• Barnego pump modifications – design works	\$8,000	
• Paretai outfall structure modifications – planning & design	\$54,000	
• Operating expenditure		\$1,106,000
2020/21		
• Culvert and bridge upgrades	\$28,000	
• Barnego pump modifications – replacement pump	\$387,000	
• Paretai outfall structure modifications to improve drainage	\$388,000	
• Balclutha floodbank improvements – structure integrity	\$8,000	
• Operating expenditure		\$1,065,000
2021/22		
• Culvert and bridge upgrades	\$29,000	
• Balclutha floodbank improvements – structure integrity	\$488,000	
• Improve drainage at Smith Road pumping station - design	\$8,000	
• Operating expenditure		\$1,090,000
2022/23		
• Culvert and bridge upgrades	\$30,000	
• Balclutha floodbank improvements	\$23,000	
• Drainage at Smith Rd pump station - design	\$4,000	
• Operating expenditure		\$1,074,000
2023/24		
• Culvert and bridge upgrades	\$31,000	
• Balclutha floodbank improvements – structure integrity	\$5,000	
• Drainage at Smith Rd pump station – improve pumping efficiency	\$131,000	
• Operating expenditure		\$1,090,000
2024/25		
• Culvert and bridge upgrades	\$32,000	
• Drainage at Smith Road pump station – improve pumping efficiency	\$9,000	
• Operating expenditure		\$1,095,000
2025/30		
• Floodbank improvement works – replace 40 relief wells, weighting blanket, and 3 training lines.	\$3,900,000	
• Spillway replacement, Paretai outfall structure and Kaitangata locks control works	\$2,305,000	
• Pump station refurbishment - parts of Kaitangata, Rutherfords, Smith Rd and Paretai	\$557,000	
• Bridge upgrades	\$223,000	

• Operating expenditure		\$5,475,000
2030/35		
• Pump station refurbishment - parts of Smith Rd and Barnego	\$278,000	
• Operating expenditure		\$5,475,000
2035/40		
• Pump station refurbishment – parts of Kaitangata, Rutherfords, and Paretai	\$1,392,000	
• Operating expenditure		\$5,475,000
2040/45		
• Pump station refurbishment – parts of all five pump stations	\$1,531,000	
• Operating expenditure		\$5,475,000
Total Estimated Cost of Works	\$13,667,000	\$33,006,000

Lower Taieri Flood Protection

Capital and operating expenditure for the next 30 years is shown below. Changes to capital expenditure may be incurred following planned investigations as follows:

- Over the first two years of the plan, council will be assessing the condition and structural integrity of scheme floodbanks. Improvements to floodbanks has been programmed in over the 30 year period, but may be amended, depending on the results of the assessment.
- In 2015/16 Council will investigate either constructing new upper/lower pond link spillways or alternatively relocating the floodbank(s) through the chute of the Taieri River and undertaking associated works. Consultation on these options will take place during the 2016/17 year, and following design and approval, construction is planned to commence 2020/21. The schedule below shows works for the upper/lower pond spillway, however this may change depending on what the final preferred option may be.
- In 2017/18 council will be discussing levels of service with the Lower Taieri community, which may result in changes to the current levels provided.

	Capital	Operating
2015/16		
• Floodbank reconstruction works – Contour channel	\$158,000	
• Weighting blanket at Otokia	\$108,000	
• Operating expenditure		\$651,000
2016/17		
• Floodbank reconstruction – design Taieri floodbank	\$43,000	
• Operating expenditure		\$521,000
2017/18		
• Floodbank reconstruction – design/approvals Taieri floodbank	\$21,000	
• Operating expenditure		\$461,000
2018/19		
• Floodbank reconstruction works – Taieri and Contour channel	\$219,000	
• Operating expenditure		\$495,000

2019/20		
• Floodbank - reprofile Taieri left floodbank	\$349,000	
• Operating expenditure		\$410,000
2020/21		
• Floodbank – reprofile Taieri floodbank	\$418,000	
• Upper/lower pond spillway – improve scheme operation	\$1,294,000	
• Upper pond cut off bank works – replace to improve safety	\$406,000	
• Operating expenditure		\$587,000
2021/22		
• Upper/lower pond spillway – improve scheme operation	\$1,810,000	
• Upper pond cut off bank works – replace to improve safety	\$373,000	
• Operating expenditure		\$584,000
2022/23		
• Floodbank reconstruction works – Contour channel	\$201,000	
• Upper/lower pond spillway – improve scheme operation	\$1,187,000	
• Upper pond cut off bank works – replace to improve safety	\$383,000	
• Operating expenditure		\$692,000
2023/24		
No works identified.		
• Operating expenditure		\$518,000
2024/25		
• Floodbank reconstruction works – Contour channel	\$203,000	
• Operating expenditure		\$582,000
No works capital works have been identified during period 2025/26 to 2045, based on the estimated life of the assets, and the significant amount of works completed to date on this scheme. Operating expenditure for this period is shown below:		
2025/30		\$2,910,000
2030/35		\$2,910,000
2035/40		\$2,910,000
2040/45		\$2,910,000
Total Estimated Cost of Works	\$7,173,000	\$17,141,000
West Taieri Drainage		
Capital and operating expenditure for the next 30 years is shown below. In 2017/18 council will be discussing levels of service with the West Taieri community, which may result in changes to the current levels provided.		
	Capital	Operating
2015/16		
• Culvert and bridge upgrades	\$25,000	
• Operating expenditure		\$591,000
2016/17		
• Culvert and bridge upgrades	\$113,000	

• Improvement in water quality discharges	\$56,000	
• Operating expenditure		\$638,000
2017/18		
• Culvert and bridge upgrades	\$26,000	
• Improvement in water quality discharges	\$53,000	
• Operating expenditure		\$670,000
2018/19		
• Culvert and bridge upgrades	\$124,000	
• Operating expenditure		\$588,000
2019/20		
• Culvert and bridge upgrades	\$129,000	
• Operating expenditure		\$602,000
2020/21		
• Culvert and bridge upgrades	\$28,000	
• Operating expenditure		\$592,000
2021/22		
• Culvert and bridge upgrades	\$136,000	
• Operating expenditure		\$628,000
2022/23		
• Culvert and bridge upgrades	\$90,000	
• Operating expenditure		\$703,000
2023/24		
• Culvert and bridge upgrades	\$144,000	
• Operating expenditure		\$650,000
2024/25		
• Culvert and bridge upgrades	\$31,000	
• Henley pump station controls replacement and electrical and controls replacement at Waipori	\$439,000	
• Operating expenditure		\$724,000
2025/30		
• Pump station refurbishment – part of Waipori	\$70,000	
• Bridge upgrades	\$1,058,000	
• Operating expenditure		\$3,620,000
2030/35		
• Pump station refurbishment – part of Waipori and Henley	\$313,000	
• Operating expenditure		\$3,620,000
2035/40		
• Pump station refurbishment - part of Ascog and Waipori	\$418,000	
• Operating expenditure		\$3,620,000

2040/45

• Pump station refurbishment – part of Henley and Waipori	\$592,000	
• Operating expenditure		\$3,620,000
Total Estimated Cost of Works	\$3,845,000	\$20,866,000

East Taieri Drainage

Capital and operating expenditure for the next 30 years is shown below. Changes to capital expenditure may be incurred following planned investigations as follows:

- In 2015/16 Council will investigate options to improve the drainage of the upper pond after inundation/flood including options to improve the effectiveness of the Silver Stream pump station. Options will be consulted on in 2016/17, with construction commencing 2019/20.
- In 2017/18 council will be discussing levels of service with the East Taieri community, which may result in changes to the current levels provided.

	Capital	Operating
2015/16		
• Culvert and bridge upgrades	\$25,000	
• Operating expenditure		\$502,000
2016/17		
• Culvert and bridge upgrades	\$26,000	
• Improvement in water quality discharges	\$97,000	
• Operating expenditure		\$483,000
2017/18		
• Culvert and bridge upgrades	\$26,000	
• Improvement in water quality discharges	\$88,000	
• Operating expenditure		\$543,000
2018/19		
• Culvert and bridge upgrades	\$27,000	
• Scrogg pump station refurbishment – design work	\$10,000	
• Drainage improvements to empty upper pond at Silverstream pump station	\$76,000	
• Operating expenditure		\$503,000
2019/20		
• Culvert and bridge upgrades	\$27,000	
• Scrogg pump station refurbishment	\$95,000	
• Drainage improvements to empty upper pond at Silverstream pump station	\$151,000	
• Operating expenditure		\$417,000
2020/21		
• Culvert and bridge upgrades	\$28,000	
• Drainage improvements to empty upper pond at Silverstream pump station and around outlet	\$540,000	
• Operating expenditure		\$429,000

2021/22		
• Culvert and bridge upgrades	\$29,000	
• Operating expenditure		\$412,000
2022/23		
• Culvert and bridge upgrades	\$30,000	
• Operating expenditure		\$423,000
2023/24		
• Culvert and bridge upgrades	\$31,000	
• Operating expenditure		\$434,000
2024/25		
• Culvert and bridge upgrades	\$32,000	
• Operating expenditure		\$445,000
2025/30		
• Pump station refurbishment – part Scroggs, Mill Creek & Silverstream	\$348,000	
• Bridge upgrades	\$613,000	
• Operating expenditure		\$2,225,000
2030/35		
• Operating expenditure		\$2,225,000
2035/40		
• Pump station refurbishment – part Scroggs, Mill Creek & Silverstream	\$974,000	
• Operating expenditure		\$2,225,000
2040/45		
• Pump station refurbishment – part Mill Creek & Silverstream	\$696,000	
• Operating expenditure		\$2,225,000
Total Estimated Cost of Works	\$3,969,000	\$13,491,000

Tokomairiro Drainage

Capital and operating expenditure for the next 30 years is shown below. Changes to capital expenditure may be incurred following planned investigations as follows:

- In 2017/18 Council will consult communities on the adequacy of the scheme's level of service. This may lead to the construction of drainage improvements if required.

Capital

Operating

For the first 10 years of the plan, no capital expenditure has been identified as being required.

Operating expenditure for each year is shown below:

2015/16	\$106,000
2016/17	\$96,000
2017/18	\$98,000
2018/19	\$101,000
2019/20	\$103,000
2020/21	\$106,000
2021/22	\$109,000

2022/23		\$112,000
2023/24		\$115,000
2024/25		\$118,000

2025/30

- Bridge upgrades \$1,114,000
- Operating expenditure \$590,000

For the last 15 years of the plan, no capital expenditure has been identified as being required.
Operating expenditure this period is shown below:

2030/35		\$590,000
2035/40		\$590,000
2040/45		\$590,000

Total Estimated Cost of Works	\$1,114,000	\$3,434,000
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TOTAL ESTIMATED COST OF WORKS	\$46,781,000	\$111,739,000
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