Lower Dandenong Creek Litter Action Plan

March 2024

Supporting partner

EPA VICTORIA

Endorsing partners

City of KINGSTON

GREATER DANDENONG City of Opportunity

City of Casey

Melbourne Water

Parks VICTORIA

Acknowledgement of the Traditional Owners of the lands and waters

For tens of thousands of years, the basin surrounding what is now known as the Dandenong Creek, the Mordialloc Creek, the Eumemmerring Creek, and the Patterson River cared for and was cared for by the Bunurong people of the Kulin Nation. Before European settlement, the gentle hills of the Greater Dandenong and Casey areas were vegetated with open woodland, flowing down to a wide floodplain forested with Red Gums, giving way to the swamps that fringed Port Phillip Bay.

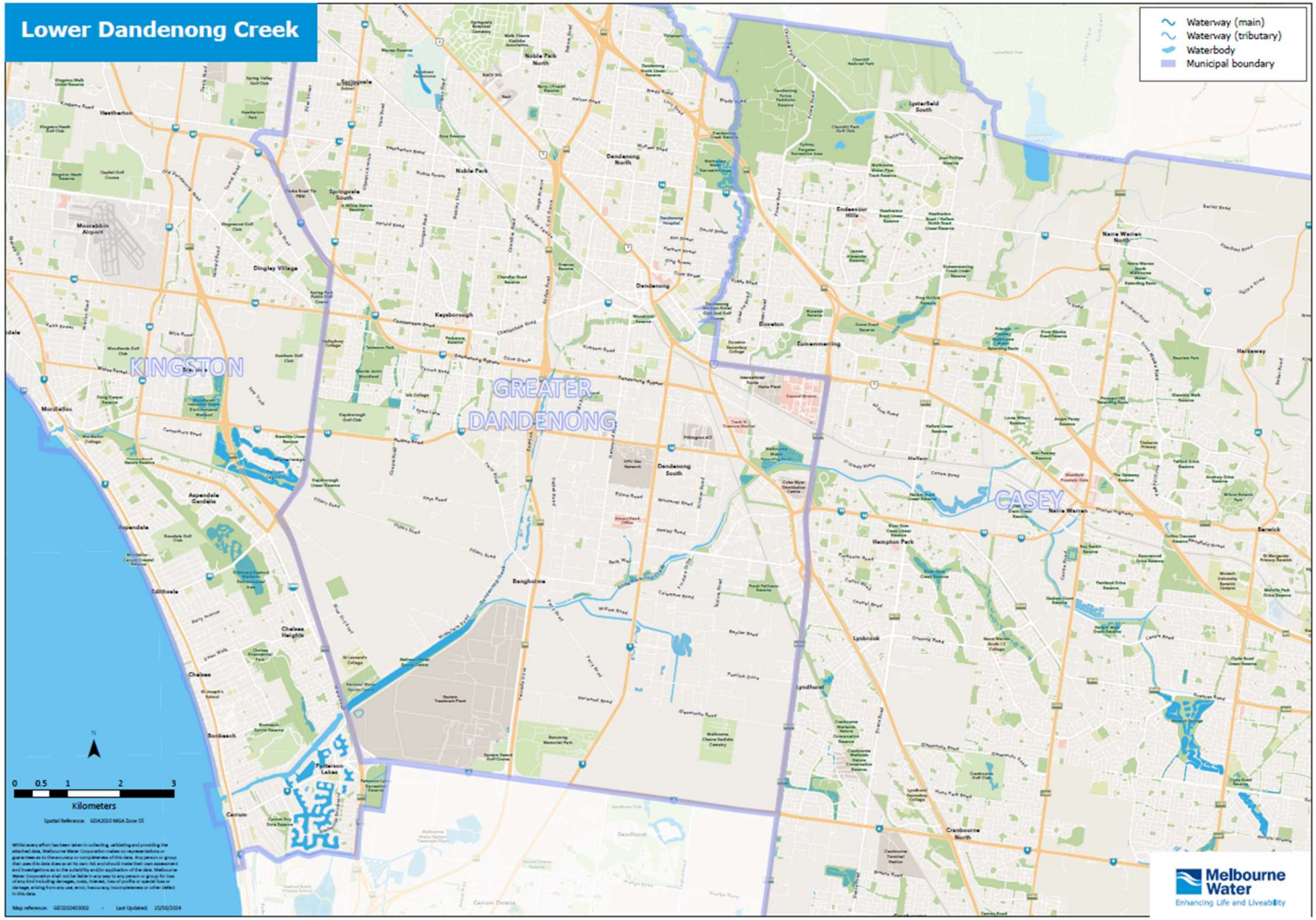
In Aboriginal lore, people and the lands and waters through which they live are not separate; they are of each other. When those lands and waters are not cared for – when they are littered or otherwise abused – that harms the people also. Despite all the development along and around the waterways of this system, there remain cultural values to protect and cultural meaning in the act of protecting those values.

This collaboration acknowledges the deep and lasting connection of the Traditional Owners to these lands and waters, and hope the efforts of the actions taken contributes in some way – however small – to respecting that connection.

Contents

Lower Dandenong Creek Catchment area

Incorporating Eumemmerring Creek, Hallam Main Drain, Mile Creek, Mordialloc Creek, Dandenong Creek, Patterson River and tributaries



Introduction: The Lower Dandenong Creek Litter Collaboration

The Lower Dandenong Creek Litter Collaboration brings together the **Cities of Casey, Greater Dandenong** and **Kingston, Parks Victoria, Melbourne Water** and the **Environmental Protection Authority Victoria** to tackle litter at a whole-of-catchment scale.

Problem statement

Litter within the Lower Dandenong Creek catchment is having an ongoing and widespread negative effect on both community and environmental values.

For many years, Councils and other agencies with litter management responsibilities have independently taken action to address the litter issue, but individual organisations tackling litter within the boundaries of the land and creekline they manage does not match with the systemic and interconnected nature of the problem.

95% of the litter found on the beaches in Port Phillip Bay comes from suburban streets, so coordinating litter management across both land and waterways is crucial to the solution.

Our solution

By taking action strategically and at a whole-of-catchment scale, we can more effectively manage litter across the catchment and reduce the volumes of litter entering waterways and reaching Port Phillip Bay, which will improve the social, environmental and cultural values of these waterways for today, tomorrow and future generations to come.

Considering litter management at a catchment-scale as a shared responsibility across land and waterway managers, and coordinating information and on-ground action between those managers, can:

- leverage existing resources;
- target new interventions more effectively;
- coordinate community involvement more successfully; and
- improve overall outcomes across partners and for the community.

Working together presents a great opportunity for litter management partners, as well as the community, to work together to better understand the issue and help develop collaborative solutions.

The collaboration, that commenced in late 2020, is based on the common agenda that litter management is a shared responsibility, and that effective litter management over the long term requires collection of complementary interventions – from education to infrastructure to enforcement to maintenance – planned strategically and driven by data.

Note: this Action Plan should be read in conjunction with the 2022 Alluvium report 'Whole of system approach to litter management – Lower Dandenong Creek', which identifies the specific sites of greatest concern (Regional Hot Spots) and the existing infrastructure network within the Lower Dandenong Creek catchment system.

Strategic alignment

This Action Plan and the Collaboration that underpins it aligns with the Healthy Waterways Strategy (HWS) for the Port Phillip and Westernport region, which identifies litter and other pollution as one of the two most significant threats to the environmental, social and cultural values of waterways of our region (the other significant threat is increasing stormwater volume and velocities). The HWS includes Regional Performance Objectives 26 and 27, which emphasise better data collection and sharing to drive litter reduction, and that multi-pronged approaches to litter management – from awareness-raising to infrastructure to enforcement – are utilised.

Further, the HWS catchment program for the Dandenong catchment sets a target for litter condition in the Dandenong Catchment – measured as absence of litter – to improve from a projected 'moderate' level (based on current trajectory) to a target level of 'very high'. The Lower Dandenong Creek Litter Action Plan is a significant step towards achieving these strategy target and performance objectives.

Councils and Melbourne Water also partner in the Integrated Water Management Action Plan for the Dandenong Catchment. This collaboration delivers on three of these strategic objectives:

1. Contributing to healthy and valued waterways and marine environments (through reducing litter ending up in waterways, and subsequent microplastics that negatively impact aquatic life);
2. Healthy and valued urban landscapes (through source management options); and
3. Community values reflected in place based planning (through utilising customer complaints data, community litter audits, and taking seriously the issue of litter's negative impact on amenity and on-water recreation).

The Lower Dandenong Creek Litter Action Plan also contributes to the achievement of objectives and goals outlined in strategies and plans of each local government partner, specifically:

- Kingston City Council's Integrated Water Management Plan, where Strategic Objective 2 is to "Protect our Waterways and Bay from Pollution […] To improve the quality of stormwater runoff from local areas flowing into water courses and Port Phillip Bay, with a focus on reducing litter and all forms of pollution"
- The City of Greater Dandenong's *Sustainability Strategy 2016 – 2030* which commits council to "work with the community to provide clean streets and waterways by reducing littering and dumped rubbish."
- Casey City Council's Environment Strategy 2021 – 2025 to "reduce the amount and improve the quality of stormwater entering Port Phillip and Western Port Bay [including reducing litter volumes]."

Importantly, all partners in the Lower Dandenong Creek litter collaboration are also required under the Environment Protection Act to take all reasonable steps to eliminate or reduce the risk of harm to human health or the environment associated with our operations (Section 25). Also known as the General Environmental Duty, this requirement – in the case of public land managers like Parks Victoria, Melbourne Water and local councils – includes proactively reducing risks to human health and the environment in our management of land, and effectively managing the local environment for biodiversity and amenity.

This Plan

This Lower Dandenong Creek Litter Action Plan outlines **specific actions** that will contribute to the overall collaboration objective of reducing total litter loads in the lower Dandenong Creek waterway and stormwater network, and ultimately to Port Phillip Bay.

These actions have been identified through:

- Analysis of a wide range of data relating to litter generation hotspots, litter accumulation hotspots, problem litter types, stormwater systems that transport litter, and existing litter management interventions across the catchment;
- Ongoing data collection, sharing, and analysis; and
- The collective experience and knowledge of the collaboration group and other key stakeholders.

Actions follow the definition given through the Department of Environment Land Water and Planning (DELWP)-lead Integrated Water Management Forums; they "*specify what will have to be delivered and how each action will be delivered including by whom, when, and where in the catchment*".

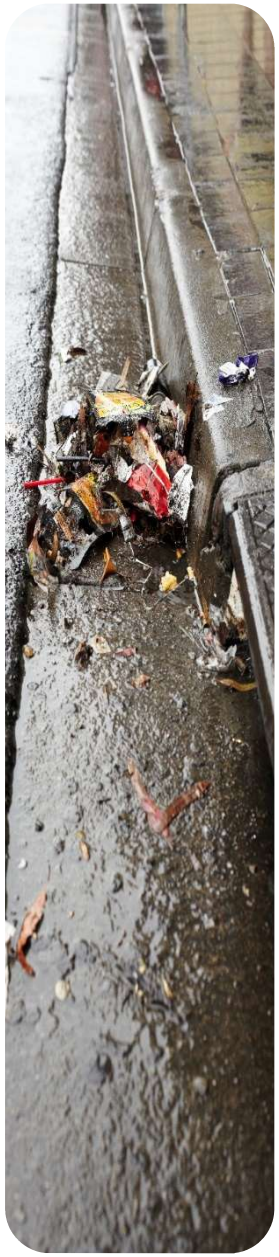
Actions are both structural or non-structural, but all include definition of how their implementation is expected to positively contribute to the outcomes sought.

This Action Plan adopts a definition of litter as human-made waste that is visible when deposited on waterway banks and is transportable through the stormwater network. Some of the approaches to manage dumped rubbish and pollutants like oils involve significantly different kinds of interventions, many of which are out of scope of this Action Plan. However, the delivery of actions within this Action Plan are hoped to produce a flow-on effect, with less litter in public spaces creating greater stewardship of our waterways and parks overall, also helping to reduce dumped rubbish and pollution.

The Lower Dandenong Creek Litter Collaboration Action Plan compliments and extends upon existing strategies and plans of individual partners by defining a coordinated approach across all partners that prioritises actions for the whole catchment and maximises the investment of all partners for the benefit of the broader community.

Implementation of this Plan will be supported by ongoing coordination through a partner Working Group and oversight from senior management Sponsors from each partner.

This Plan has been endorsed by those Sponsors from each council, Melbourne Water and Parks Victoria. Endorsement of the Plan means a commitment to collaboration to implement actions, working together on ongoing adaptive management to plan for future actions, reviewing what is working and needs improvement, and securing investment. Funding to progress any action by any partner will remain dependent on that funding being prioritised against other programs and projects within that partner's responsibility, but the data-driven and collaborative nature of this project will help build convincing business cases where needed.



A place-based approach

At each identified **litter generation hotspot**, opportunities were considered to:

- Improve or enhance infrastructure;
- Improve or expand maintenance;
- Target compliance and enforcement;
- Target community education and engagement; and
- Improve data collection or other means for understanding the litter issue at that place.

At key **litter accumulation hotspots**, options considered include:

- Trace back through the stormwater system where litter is likely to be coming from, and ensure those locations are included as litter generation hotspots;
- Improve data collection or other means for understanding the litter types, sources and impact to the specific values at that place;
- Consider the cost/benefit of improved maintenance or infrastructure at that place, or upstream of that place;
- Consider the feasibility and benefit of engaging the community for clean-ups; and
- Consider educational opportunities (e.g. signage).

Community engagement and education opportunities

Community education and engagement has been considered at both local scale and across the whole catchment area. At both scales, opportunities have been considered in the context of catchment data (e.g. targeted at generation hotspots) and driven by best practice.

Key to the success of engagement and education activities is alignment and amplification of messages, so partners working together, leveraging shared messages, shared collateral, and using shared touchpoints is crucial.

Prioritisation of actions

All potential actions at specific sites and across the catchment have been analysed by the Lower Dandenong Creek Litter Collaboration partners and prioritised according to the following criteria:

Benefit-cost	Actions with higher benefit and lower cost are prioritised as short-term actions, and actions with the highest benefit are prioritised overall.
Resources required	An action may be high cost but already have resourcing planned; where resources already exist or can be readily secured, actions are identified as having a shorter implementation timeframe.
Alignment with strategic objectives	Actions that are clearly aligned with existing strategic objectives across the partners and other key stakeholders are prioritised

Actions listed in the following pages have been considered, tested and prioritised against these criteria.

What does success look like?

Outcome number	Description	Indicator(s)	Measurement
Outcome 1	Better engagement, education, and enforcement with businesses and the community reduces the amount of litter entering the stormwater system (including waterways).	Downstream monitoring of key sites where interventions are delivered demonstrate reduction in loads of litter over time from baseline.	Reduction over time in average litter measured at key waterway sites downstream of where education, engagement or enforcement initiatives are targeted, compared to before the initiative.
Outcome 2	Litter is prevented from entering the stormwater system through better collection of litter on land (e.g. improved street sweeping programs, bins in the right places emptied at the right times).	Downstream monitoring of key sites where interventions are delivered demonstrate reduction in loads of litter over time from baseline.	Reduction over time in average litter measured at key waterway sites downstream of where changed street litter management initiatives are targeted, compared to before the initiative.
Outcome 3	Infrastructure within the stormwater system is better at collecting the litter that does make it to drains and waterways, stopping it from reaching the Bay.	Downstream monitoring of key sites where interventions are delivered demonstrate reduction in loads of litter over time from baseline, including sites at the end of system (Mordialloc Creek and Patterson River).	Reduction over time in average litter measured at key waterway sites downstream of where stormwater infrastructure improvements are delivered compared to before their delivery.

Outcome number	Description	Indicator(s)	Measurement
Outcome 4	All project partners share holistic and reliable data about litter volumes, problem litter types, litter sources, transmission routes, and accumulation hotspots in the catchment.	Data sharing platform and process established and maintained.	N/A
Outcome 5	Interventions to reduce litter are planned and implemented where they will be most effective, and where possible include a measurable return on investment.	Data is incorporated into business cases for new initiatives; appropriate return-on-investment frameworks are identified and utilised to support investments.	For major new litter management projects, the dollar return is demonstrated to be greater than the investment.
Outcome 6	Actions and interventions are adapted as new data is available, as new challenges emerge or as the character of the catchment changes, and the collaboration continues to manage litter effectively into the future.	Incorporation of new data into decision-making; maintaining collaboration governance.	Annual review of this Action Plan and the data supporting it.
Outcome 7	The community and local business and industry are knowledgeable about the impacts of litter in the catchment, supportive of the Lower Dandenong Creek Litter Collaboration, and contribute to improved litter management.	Improved survey results; reduced number of community complaints regarding litter management (not number of reports of littering / dumping); rate of participation in litter management.	Satisfaction scores in Melbourne Water community perception of waterways survey; number of complaints relating to litter received by partners; number of individuals and businesses involved in initiatives.

The Action Plan

Short term actions

These actions will be delivered within a two year timeframe of the endorsement of this Action Plan.

Legend

BAU = Business As Usual (integration into existing programs or processes)
$ = Low cost. Typically <$50K capital or investigation investment or <$10K reoccurring maintenance costs
$$ = Medium cost. Typically <$200K capital or investigation investment or <$30K reoccurring maintenance costs
$$$ = High cost. Typically <$500K capital investment or <$100K reoccurring maintenance costs
$$$$ = Very high. Typically large scale projects with costs into the millions

INF = Infrastructure action
MAIN = Maintenance action
COMM = Communications and engagement action
BUSN = Business engagement and enforcement action
STDA = Strategic and data action

Action ID	Description	Lead	Support	Indicative cost (by stage)	Benefit / impact on objectives
INF1	Investigate options for a new litter trap within the lower reaches of the Dandenong Creek / Eumemmerring Creek system.	Melbourne Water	City of Greater Dandenong	Investigation = $ Implementation (if feasible) = $$ Ongoing maintenance = $$ (per year)	Outcome 3; Outcome 5

Action ID	Description	Lead	Support	Indicative cost (by stage)	Benefit / impact on objectives
INF2	Deliver new Gross Pollutant Trap to service Mordialloc commercial precinct.	Kingston	N/A	Installation = $$$ Ongoing maintenance = $$ (per year)	Outcome 3; Outcome 5
INF3	Trial sensors and AI technology at key sites to support identification of problem litter types and targeted maintenance, compliance and education opportunities.	Melbourne Water	Council partners and EPA	Implementation = $-$$ Ongoing servicing and data analysis = $	Outcome 4; Outcome 6
MAIN1	Align on priority amenity sites and level of service for amenity outcomes at those sites.	Melbourne Water with Parks Victoria and each council partner	N/A	Business As Usual	Outcome 2; Outcome 4; Outcome 6
COMM1	Align on communications approaches and develop a shared litter prevention campaign, based on research and best practice.	All partners	N/A	Alignment of approaches = BAU Campaign development = $-$$	Outcome 1; Outcome 7

Action ID	Description	Lead	Support	Indicative cost (by stage)	Benefit / impact on objectives
COMM2	Implement shared communications campaign.	All partners	N/A	Implementation = BAU-$$	Outcome 1; Outcome 7
BUSN1	Target commercial and trade waste compliance and education for key litter generation hotspot areas (e.g. Springvale and Dandenong Market).	City of Greater Dandenong and EPA	MW	Engagement and approach development = BAU Additional people resourcing / collateral = $-$$	Outcome 1; Outcome 7
STDA1	Manage governance of this Action Plan, including regularly convening an Implementation Working Group, developing a rolling financial plan and implementation timeline.	Melbourne Water	All other partners	BAU	Outcome 4; Outcome 6
STDA2	Implement monitoring downstream of key sites where interventions are planned, to measure effectiveness of those interventions.	Melbourne Water	Council partners; community groups; EPA; Parks Victoria	Existing monitoring sites = BAU New sites measuring targeted interventions = $-$$	Outcome 4; Outcome 5

Action ID	Description	Lead	Support	Indicative cost (by stage)	Benefit / impact on objectives
STDA3	Monitor Dandenong Creek at upstream limit of collaboration focus area to understand contribution of upstream catchment to litter loads	Melbourne Water	Community groups; EPA; City of Greater Dandenong	Incorporated in costing for STDA2	Outcome 4; Outcome 5
STDA4	Support citizen science monitoring at high priority sites.	All partners	N/A	Integrating into existing citizen science programs = BAU Developing new citizen science programs = $-$$	Outcome 4; Outcome 7
STDA5	Coordinate data collection and analysis across partners from maintenance, community reports and other sources to inform adaptive management.	Melbourne Water	All partners	Developing shared platform / systems = $-$$ Agreements = BAU Ongoing data maintenance and analysis = $-$$ per year	Outcome 4; Outcome 5; Outcome 6

Long term actions

These actions will be delivered within a 2-5 year timeframe of the endorsement of this Action Plan.

Legend

BAU = Business As Usual (integration into existing programs or processes)
$ = Low cost. Typically <$50K capital or investigation investment or <$10K reoccurring maintenance costs
$$ = Medium cost. Typically <$200K capital or investigation investment or <$30K reoccurring maintenance costs
$$$ = High cost. Typically <$500K capital investment or <$100K reoccurring maintenance costs
$$$$ = Very high. Typically large scale projects with costs into the millions

INF = Infrastructure action
MAIN = Maintenance action
COMM = Communications and engagement action
BUSN = Business engagement and enforcement action
STDA = Strategic and data action

Action ID	Description	Lead	Support	Indicative cost (by stage)	Benefit / impact on objectives
INF4	Inform stormwater asset renewal / improvement program with data and priority sites identified in the Lower Dandenong Creek Litter Collaboration Alluvium report.	Council partners	N/A	Prioritisation = BAU Further investigations and feasibility = $$	Outcome 3; Outcome 5; Outcome 6
INF5	Feasibility analysis of highest priority opportunities for new gross pollutant traps (GPTs) or other stormwater-system-based infrastructure across the	Melbourne Water	Council partners	Detailed feasibility analysis = $$	Outcome 5; Outcome 6

Action ID	Description	Lead	Support	Indicative cost (by stage)	Benefit / impact on objectives
	catchment (longlist based on Alluvium report)				
INF+MAIN1	Assess land-based litter management at key hotspots across the catchment to identify improvement opportunities	Council partners and PV	Melbourne Water	Consultant support for assessing improvement options (if needed) = $-$$	Outcome 2; Outcome 4; Outcome 6
MAIN2	Trial amenity hotspot maintenance approach to include 'just-in-time' maintenance for key waterway sites ahead of significant rainfall forecast	Melbourne Water	All council partners	Trail = BAU-$ Ongoing implementation if effective = $-$$	Outcome 2; Outcome 5
MAIN3	Investigate trial of 'just-in-time' maintenance of street litter infrastructure using QR codes	Greater Dandenong and Casey	Kingston	Scoping = BAU-$ Implementation = $ Ongoing maintenance = BAU	Outcome 2; Outcome 6; Outcome 7
COMM3	Work with engaged community groups to target clean-ups to identified accumulation hotspots	Council partners and PV	Melbourne Water	BAU	Outcome 5; Outcome 7

Action ID	Description	Lead	Support	Indicative cost (by stage)	Benefit / impact on objectives
COMM4	Target communications campaign at key coastal hotspots	Kingston	N/A	Initial integration of new shared campaign = BAU Additional elements = $-$$	Outcome 1; Outcome 7
BUSN2	Target communications and education campaign at key industrial and coastal litter generation hotspots	Council partners	EPA	Initial campaign collateral developed through COMM1 Additional people resourcing / collateral = $$	Outcome 1; Outcome 7
BUSN3	Audit waste management processes and infrastructure at commercial regional hotspots	EPA	Council partners	BAU-$$	Outcome 2; Outcome 5
STDA6	Engage with Department of Transport & Planning (DTP) on potential uplift of maintenance of roadsides and major road swales where litter accumulates	Melbourne Water and EPA	All partners	Business As Usual	Outcome 2

Future opportunities

Outcomes of both the short term and long term actions will open up future opportunities, including advocating for additional State or Federal investment based on improved data and understanding of return on investment.

The above actions list is not considered exhaustive of the opportunities to improve litter management at a catchment scale, and the ongoing adaptive review and implementation of this Lower Dandenong Creek Litter Collaboration Action Plan will include proactively seeking new approaches and incorporating new opportunities as they emerge.

As the partners also commit to this Action Plan, we also commit to:

- Advocating for and contributing data to regional, State and Federal initiatives such as container deposit schemes and single use plastic bans;
- Sharing the Lower Dandenong Creek Litter Collaboration catchment approach and lessons learned with other parties wherever possible; and
- Working with business and the community on long term solutions wherever possible.

Project contact

Project Management for the Lower Dandenong Creek Litter Action is through the Service Partnerships team at Melbourne Water.

The team can be contacted at servicepartnerships@melbournewater.com.au

APPENDIX 1: FURTHER DETAIL ON EACH ACTION

INF1: Investigate options for a new litter trap within the lower reaches of the Dandenong Creek / Eumemmerring Creek system

Litter traps can be effective as end-of-system options to help manage litter, but must be implemented as part of holistic approaches to managing litter across a catchment.

Within the Lower Dandenong Creek system, the most beneficial location for a litter trap – collecting the most litter before it enters Port Phillip Bay, while also not impacting recreation or amenity values through the trap itself – is just upstream of the National Watersports Centre at the top of Patterson River. That location is just downstream of the Eumemmerring Creek and Dandenong Creek confluence, thus servicing more than 80% of the land focused on through this project.

However, previous attempts to install litter traps at this location have failed because of the velocity of flows (trap anchors were pulled loose), and the cost of engineering heavier duty solutions is prohibitive. The ongoing maintenance costs for heavier duty units are also much more significant, and at this site the levy bank makes access difficult.

Through this project, options for new types of litter trap utilising new technologies are being explored. The project is also scoping options for more conventional litter traps located further upstream, in lower sections of Eumemmerring Creek and/or Dandenong Creek, where flows are lower but significant percentages of the catchment land would still be covered.

INF2: Install new Gross Pollutant Trap to service Mordialloc Creek Shopping Centre precinct

Mordialloc shopping precinct was identified as a key regional litter generation hotspot in the Alluvium whole of catchment analysis.

The Alluvium report reinforces analysis done by Kingston council, where council had identified this stormwater drainage line as one of the highest priorities within the municipality for new litter management infrastructure.

A new gross pollutant trap (GPT) has been investigated for this area, and is being designed at present, with construction subject to tender. This asset will service the majority of the local catchment of the Mordialloc Shopping Centre precinct.

INF3: Trial sensors and AI technology at key sites to support identification of problem litter types and targeted maintenance, compliance and education opportunities

Sensors that support 'just-in-time' maintenance have been trialed on different kinds of assets in different catchments across the Melbourne Water operating area with varying levels of success; given the focus on data driven investment in this project, opportunities to use sensors in this way – in particular in stormwater assets – will be proactively sought.

Melbourne Water has also trialed cameras linked to artificial intelligence to identify types of litter entering the stormwater system through specific drains or wetland systems. This information can help target follow-up education and enforcement activities. AI monitoring will be trialed in the Lower Dandenong Catchment at key site(s) where more information is needed to inform the right intervention.

INF4: Inform stormwater asset renewal / improvement program with data and priority sites identified in the LDCLC Alluvium report

Each council in the Lower Dandenong Creek Litter Collaboration project conduct analysis of the performance of their existing assets and analysis of potential new assets as part of their capital planning and infrastructure performance auditing processes.

The analysis of the most significant regional litter generation hotspots – and the area any existing infrastructure is serving across those regional hotspots – from this project is important data to help inform where new infrastructure may be of greatest benefit, or which existing infrastructure would benefit most from renewal or expansion.

Council partners will utilise the whole-of-catchment view of priority sites to inform their asset performance investigations and asset renewal programs into the future.

INF5: Feasibility analysis of highest priority opportunities for new gross pollutant traps (GPTs) or other stormwater-system-based infrastructure across the catchment (longlist based on Alluvium report)

The whole-of-catchment analysis of problem litter types, hotspots, and existing infrastructure report by Alluvium identified a number of sites where the combination of land use and local stormwater catchment size suggest new GPTs or equivalent infrastructure solutions could be of significant benefit. However, that analysis requires 'ground truthing' based on knowledge of local capital asset and maintenance teams and detailed analysis of the feasibility of new infrastructure at those sites.

Given the significant costs of new infrastructure and the shared responsibility for litter management, where new assets are found to be feasible, the collaboration will collectively seek external co-funding to deliver.

INF+MAIN1: Assess land-based litter management at key hotspots across the catchment to identify improvement opportunities

Approximately 90% of litter that accumulates along waterways travels there from suburban streets, carried by roadside drains and underground pipes. Having the right street litter infrastructure – from bins to grates on drains – in the right places, and ensuring effective management of that infrastructure, is crucial to minimising the amount of litter that makes it down drains and into waterways.

This action will take a holistic approach to litter management at key litter generation hotspots. It will start with information sharing and collective auditing of existing street litter infrastructure and management approaches, and then identify improvements – process and structural – that can help reduce the volumes of litter reaching the stormwater system.

MAIN1: Align on priority amenity sites and level of service for amenity outcomes at those sites

Land 'parcels' along waterways are managed by different agencies, including council, Melbourne Water and Parks Victoria. The level of service delivered by different agencies – how often grass is mown, litter is collected etc. – can be different even along the same stretch of waterway, which can lead to poor amenity outcomes.

Aligning across agencies on sites prioritised for amenity and on the level of service for those sites will help deliver more consistent maintenance outcomes and improved places for our communities to enjoy.

MAIN2: Trial amenity hotspot maintenance approach to include 'just-in-time' maintenance for key waterway sites ahead of significant rainfall forecast

'Litter trackers' research by RMIT along the Dandenong Creek shows that litter within this system moves along waterways sporadically, being caught in riparian vegetation or left high on banks until rainfall flushes it further down the system, where it often gets caught again.

The Alluvium whole-of-catchment report identified some sites that are likely culprits for trapping litter until high rainfall flushes it further down, eventually reaching the Bay. On-ground crews of councils and Melbourne Water will know other likely sites where litter is often temporarily caught. These 'litter accumulation hotspots' sites are often not in highly visited or easily accessible areas of the system, but contribute to impacting the amenity of the system as a whole.

This action will test whether 'just-in-time' maintenance of these litter accumulation hotspots – targeting clean-up just ahead of significant forecast rainfall – to measure if this kind of maintenance reduces overall litter loads ending up at the end of the system.

Monitoring sites downstream of the first trial sites for just-in-time maintenance will be measured over time for an indicator of the impact of this just-in-time approach.

This approach will be trialed by Melbourne Water, and broadened pending an analysis of impact relative to cost.

MAIN3: Investigate trial of 'just-in-time' maintenance of street litter infrastructure using QR codes

Kingston City Council have successfully rolled-out an approach that improves the efficiency of emptying over 800 public litter bins at shopping centres and along the foreshore. The contractor is directly notified by the community that maintenance is needed via a QR code on the asset using a sticker with a unique code for each bin. The approach has been deemed a success by the community and by council, with any increase in maintenance cost offset by savings in administration costs and less redundancy in programmed maintenance runs.

This action is for the other councils within the Lower Dandenong Creek Litter Collaboration partnership (Casey and Greater Dandenong) and PV to trial the same QR code maintenance approach of street litter infrastructure as piloted by Kingston.

COMM1: Align on communications approaches and develop a shared campaign, based on best practice and analysis of existing collateral and approaches

Prevention is more effective than cure, and stopping individuals littering and having businesses and industry proactively manage their own litter is the best approach to litter management. However, behaviour change and cementing positive behaviours is more complex than just reaching the intended audience.

While each of the partners in the Lower Dandenong Creek Litter Collaboration project invest significant time and resources into community communications and engagement around littering behaviours, there is no concerted and regular alignment of these comms and engagement approaches.

A growing body of research into effective behaviour change underlines that positive behaviour change relies on consistency of messaging, and 'activation' of that messaging at the sites where negative behaviours might happen.

This action calls on partners in the Lower Dandenong Creek Litter Action Plan to understand and agree on 'best practice' communication and engagement to drive anti-littering behaviour, and develop a shared campaign that supports best practice.

COMM2: Implement shared communications campaign

This action recognises that implementing a shared comms campaign will be iterative over time, and partners will integrate shared campaign elements over time as fitting the other comms priorities they manage. Campaign implementation will include some elements that are coordinated across partners, and some that each partner will lead independently.

COMM3: Work with engaged community groups to target clean-ups to identified accumulation hotspots

Committed community groups already dedicate significant time to litter clean-up activities across the catchment; this action is to support those community groups to target their clean-up efforts more strategically to sites identified as litter accumulation hotspots and have an even greater positive impact from their efforts.

COMM4: Target communications campaign at key coastal hotspots

Through the whole-of-catchment analysis, several 'coastal hotspots' were identified; these are sites within the Kingston City Council area that are not connected to waterways but discharge stormwater directly into Port Phillip Bay. While these sites have local infrastructure that helps manage litter loads, there is the opportunity to utilise the shared communications and education campaign developed for the Lower Dandenong Creek Catchment to support positive behaviour around these coastal hotspots.

BUSN1: Target commercial and trade waste compliance and education for key litter generation hotspot areas

Engagement with council on-ground teams through the development of the whole-of-catchment analysis identified the management of trade waste and trade waste compliance in some of the older commercial areas of the catchment is a key contributor to litter loads entering the stormwater system. Key sites identified were Springvale commercial centre and Dandenong Market.

While trade waste agreements are in place for Dandenong Market and many of the traders around Springvale, understanding of these agreements – and compliance with them – is suspected to be low.

This action will target these areas to improve awareness of and compliance with these trade waste agreements and improved litter management practices.

BUSN2: Target communications and education campaign at key industrial and coastal litter generation hotspots

This action leverages off the shared communication and education campaign referenced above in relation to the broader community, also including key messages relating to the General Environmental Duty and the obligation of all businesses to be proactive in managing risks to the environment.

Priority areas for business engagement will be those where infrastructure or maintenance options are more limited, such as the industrial area around Cheltenham Road, and coastal hot spots.

BUSN3: Audit waste management processes and infrastructure at commercial regional hotspots

Having secure and enclosed waste management sites and clear access for waste services at commercial sites is important in 'containing' litter as it awaits collection or transfers from bins to trucks. Auditing the waste management processes and infrastructure at commercial regional hotspots can underpin targeted education, engagement or incentives programs to improve sites where litter is 'escaping' the waste storage and transfer process.

This action should be supported by follow-up communications, engagement, compliance or support activities.

STDA1: Manage governance of this Action Plan, including regularly convening an Implementation Working Group, developing a rolling financial plan and implementation timeline

Ongoing facilitation of an Implementation Working Group to coordinate and drive implementation of this Action Plan is needed to ensure partner commitment is maintained, broader stakeholders continue to be engaged, actions are implemented, and ongoing data-driven adaptive management and best-return-on-investment underpins that implementation.

The Working Group should be maintained until *at least* the initiation of more than 50% of the long-term actions.

The convening partner of the Working Group may rotate among partners over the life of the Action Plan.

STDA2: Implement monitoring downstream of key sites where interventions are planned, to measure effectiveness of those interventions

The key driver of this collaboration is to be more strategic, more targeted and more effective in our collective litter management efforts. Measuring the success of different interventions – close to where those interventions are implemented – over time is essential to understanding effectiveness and adaptively managing investments.

While Melbourne Water will manage monitoring overall, implementation of monitoring at specific sites may involve any of the core partners and local community groups.

STDA3: Monitor Dandenong Creek at upstream limit of collaboration focus area to understand contribution of upstream catchment to litter loads

While much of the litter that ends up in lower reaches of the catchment is generated within the catchment land identified in the Investigation phase of this project, it is still unknown how much litter is contributed by upstream catchments, carried down through Dandenong Creek.

There is something of a 'bottleneck' in the waterway system around the Dandenong Valley Wetlands just upstream of where the creek crosses into the city of Casey, which is likely to hold much of the litter from upstream catchments. Quantifying what makes it through that bottleneck can help partners understand the degree of engagement needed with upstream councils on managing litter in this waterway.

STDA4: Support citizen science monitoring at high priority sites

As above, to effectively monitor the success of different interventions and condition of the catchment overall will require broad and robust monitoring, which community groups and other citizen scientists can be key partners in delivering.

STDA5: Coordinate data collection and analysis across partners from maintenance, community reports and other sources to inform adaptive management

Consistent data collection and analysis across partners is important to maintain a whole-of-catchment view of the litter issue, and make sure partners are comparing 'apples to apples' in making decisions about where to invest and how effective those investments are.

Melbourne Water will lead the ongoing consolidation of data across monitoring, partner asset data, and from community reports and clean-up efforts; that data will support the Working Group in decision making.

STDA6: Engage with Department of Transport & Planning (DTP) on potential uplift of maintenance of roadsides and major road swales where litter accumulates

Roadsides along major roads are often hotspots for litter accumulation and therefore important areas to include in improved litter management efforts, but not managed by core partners in this Lower Dandenong Creek Litter Action Plan.

Opportunities to engage Department of Transport will be strengthened as the effectiveness of different approaches in this Action Plan can be demonstrated.