

Engaging Communities on Waste: Final report and recommendations

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Lastly we would like to thank the Victorian residents who participated in the survey conducted in Phase 3 of the research.

About Sustainability Victoria

Sustainability Victoria is a Victorian government agency and our vision is for a sustainable and thriving Victoria.

Our purpose is to support Victorians to use resources more sustainably and to take practical action on climate change – we do this via delivering programs and shaping policy.

We also have obligations under the Environment Protection Act 1970 for statewide waste management strategy and planning.



1 Introduction

As the links between population growth, urban planning and waste management become clearer, the need for community involvement and cooperation with the waste and resource recovery sector becomes more important if we are to achieve sustainable waste management outcomes for our cities and towns.

The waste and resource recovery sector functions as an integrated system involving different types of infrastructure and a range of stakeholders. The nature and function of the infrastructure over forthcoming decades will need to adapt and change to the changing demands of communities. Community support and involvement is necessary for achieving the best outcomes.

This report provides a summary of the research findings and subsequent recommendations of a joint CSIRO and Sustainability Victoria (SV) research project. The overall project investigated community perceptions and expectations of the waste and resource recovery sector and how these relate to building community trust and social acceptance in the sector.

1.1 Why engaging communities is important

Sustainable waste management extends beyond the traditional disposal of waste to landfill, and includes recycling, reusing, and recovering products. Disposal of waste to landfill has become a solution of last resort with many waste and resource recovery operators and facilities undertaking a variety of the waste and resource recovery activities.

However, the activities and locations of waste and resource recovery sites are constantly changing as the industry responds to changes in the external landscape, such as climate change, population growth, new technologies and markets, and changing societal expectations.

To achieve changes in the waste management industry that are acceptable to local communities, reflect best practice, and align with sustainable waste management strategies it is necessary to understand community perceptions about waste and its management. An understanding of community expectations and concerns regarding the waste and resource recovery sector is important to underpin community support, cooperation and collaboration with policy, programs, and plans to manage waste.

Upgrading, extending, relocating, or siting new waste and resource recovery facilities are important components for ensuring the ongoing safe and sustainable management of waste associated with a growing population. Community support and involvement in decision making is important for achieving the most effective and acceptable solutions.

Yet matters of community concern, their expectations, and how best to engage and involve community perspectives is not widely understood in the waste domain. These aspects form the basis of building trust and a social licence to operate and are necessary to understand for the sector to achieve its plans and objectives.

1.2 Project overview

PROJECT AIMS

1. Understand and measure community attitudes and perceptions about waste, and the waste and resource recovery sector
2. Identify the drivers for building trust and community acceptance of the waste and resource recovery sector, its operators, facilities, and activities
3. Identify the relative importance of the key drivers that contribute to building trust and achieving acceptance in the waste and resource recovery sector
4. Identify key contextual variables that influence levels of trust and acceptance e.g. type and location of a facility
5. Identify opportunities for policy, programs, and collaborative actions to shape behaviour among stakeholders in the waste and resource recovery sector

FOUR PROJECT PHASES

Phase 1: Preparation and Planning

Phase 2: Community group discussions and key informant interviews

Phase 3: State-wide survey

Phase 4: Feeding back results and identifying opportunities for collaborative actions

MIXED METHODS DESIGN

Using both qualitative and quantitative methods provided a holistic and robust evidence base for our project findings.

- Community group discussions and key informant interviews provided a broad and rich understanding of the topic
- A state-wide survey allowed us to measure Victorian attitudes about waste and to test a model that explains social licence to operate for this industry.

This report presents an overview of each research phase and subsequent recommendations. It also identifies gaps in knowledge and areas of future research.

2 Research overview

2.1 Phase 1: Project preparation and planning

SITE SELECTION

The planning phase identified seven waste and resource recovery sites for participation in the research. The sites acted as the focal locations or pilot sites for engaging key stakeholders and local communities, in order to understand people’s perceptions about the waste and resource recovery sector.

These site areas were chosen from the list of 23 waste and resource recovery hubs considered to be of strategic importance in Victoria’s 30 year Statewide Waste and Resource Recovery Infrastructure Plan (state waste plan) released in mid- 2015.

It was also important to include variability in the sample of sites to ensure the breadth of possible factors that might influence trust and acceptance were explored.

IDENTIFYING STAKEHOLDERS

This phase of the research also identified key stakeholders to engage in the research as participants. These included community and

industry stakeholders who were involved with the participating waste and resource recovery sites, such as local community reference groups and the site operators. Stakeholders involved with the waste and resources sector more generally were also identified, including those involved with planning, and regulating the waste and resource recovery sector.

Six criteria to assess sites for participation

- Type of operator (local council or private company)
- Location, in terms of industrial precincts and neighbouring residential areas
- Size of the facility
- Type of facility function
- Community awareness and engagement
- Future plans (e.g. change in function, size, location)

The selection process resulted in seven participating waste and resource recovery sites (

Table 1).

Table 1 Participating waste and resource recovery sites

SITE	OPERATOR		LOCATION		SIZE		FUNCTION				COMM	ENG	FUTURE PLAN
	Corp	Counc	Indust	Res	Lge	Med	LandF	Org	Recov	Repro			
Werribee Landfill		√		√	√		√		√	√		Est	Organics Recov, indust zoning
Brooklyn Precinct	√		√	√	√				√	√		Est	
Clayton Precinct	√		√	√	√		√	√	√	√		Est	Landfill close
Hanson Wollert	√			√		√	√					Early	
Hallam Rd, Hampton Park	√		√	√		√	√		√	√		Est	Co-located compatible facilities

Veolia Organics, Bulla	√	√	√	√	Nil	Co-located waste water site
Mildura Landfill	√	√	√	√	√	Early

2.2 Phase 2: Community group discussions and key informant interviews

We conducted discussion groups and interviews to understand expectations and values important to communities, and the factors that underpin trust in the waste and resource recovery sector. We also explored perceptions of roles and responsibilities of the key stakeholders involved.

PARTICIPANTS

During a 6-week period, March to April 2016, we conducted seven community discussion groups and 21 interviews involving 57 participants. The participants in Phase 2 of the research were drawn from the seven participating waste and resource recovery pilot sites and their communities, plus key stakeholders from the waste and resource recovery sector. As detailed in Table 2, the community representatives were from specific community reference groups of participating sites or for those sites that did not have an established community reference group we involved local residents living near the site. The industry and government interviews included operators of the participating sites, planners, regulators, local council, educators, and community engagement consultants working in the industry.

Table 2 Summary of participants: interviews and community discussion groups

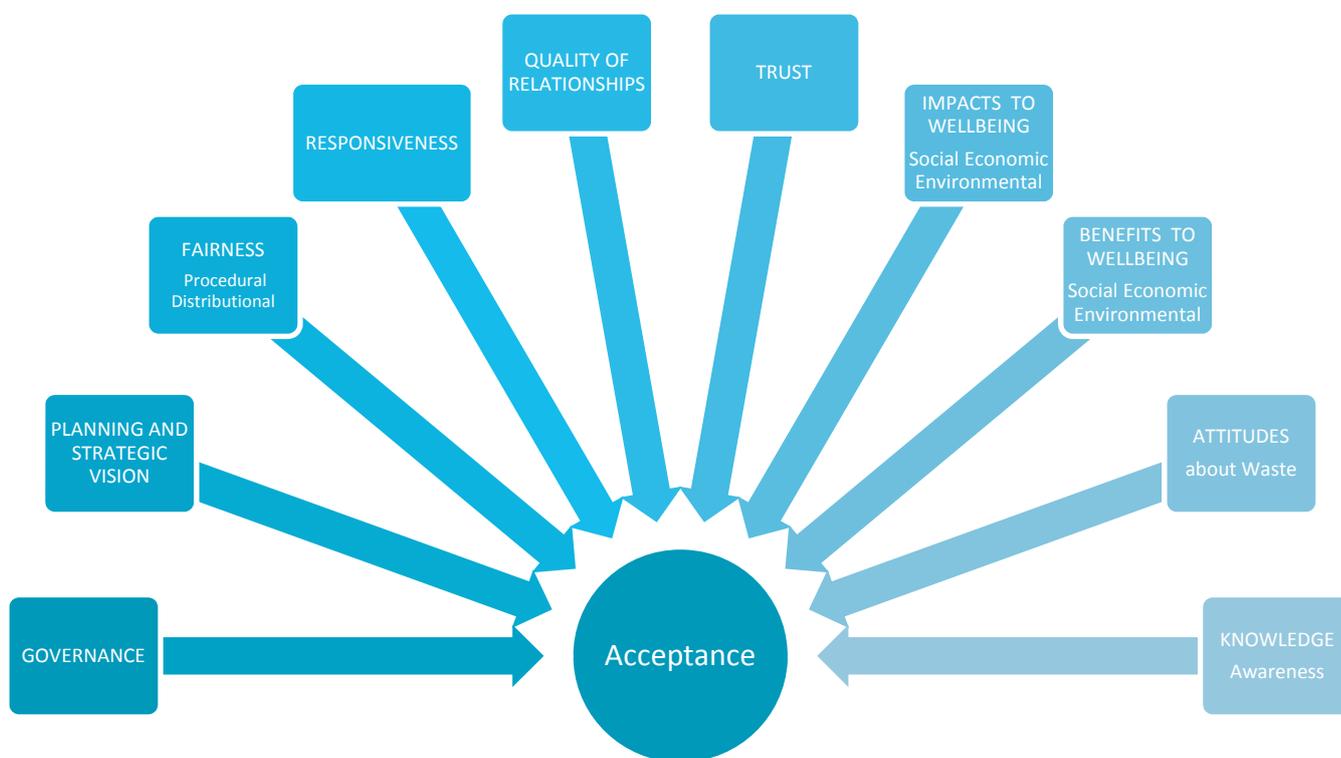
TYPES OF PARTICIPANTS	NO. OF PARTICIPANTS	COMMENTS
Community representative groups	37	<ul style="list-style-type: none"> • 4 x groups based around existing site-specific community reference groups (Brooklyn, Clayton, Werribee, Hallam Rd) • 1 x group and 3 interviews based around existing community groups in the local govt area, e.g., Local Rate Payers / Residents Assoc. in Mernda and Sunbury • 2 x groups based on local residents living near and not-near a landfill (Mildura)
Operators	9	Cleanaway, Veolia, SUEZ, Hanson, Wyndham City Council, Mildura Rural City Council, 5-Councils (Clayton)
Consultants and NGOs	3	Community Engagement professionals employed to facilitate engagement with established Community Reference Groups in the WRR sector Environment Victoria
Local Council Representatives	2 (5)	Council Community Educators (Five other participants were also from local councils and gave Council perspectives but included under the 'Operator' group)
Planners	5	Metro WRGG, Regional WRGG, Dept. Infrastructure and Planning, SV
Regulators	1	EPA
TOTAL	57	37 x Community representatives 20 x Others

FACTORS IMPORTANT FOR TRUST AND ACCEPTANCE

Drawing from the experiences of community groups and key informants we identified a range of constructs as possible variables that influence trust and acceptance in the waste and resource recovery sector. As depicted in Figure 1, these constructs act as conceptual umbrellas, which we went on to measure and test

in the survey phase of the project. Whilst the community discussion groups and interviews provided a rich and deep understanding of these variables, a survey approach is able to model the importance of each variable and how they contribute to trust and acceptance.

Figure 1 Factors that influence social acceptance of the waste and resource recovery sector



IMPACTED COMMUNITIES AND THE WIDER PUBLIC

The community discussions and interviews identified different levels of understanding and awareness between those people who live near waste and resource recovery infrastructure (*impacted communities*) and those who do not (*the wider public*). It seems that whilst the drivers of acceptance and trust overlap, there are potential differences that could be unique to each group. Ensuring we measured these differences in the survey stage of the research was important.

Impacted communities

- Trust seems dependent on the quality of relationships, fairness, governance, planning and strategic visioning, and responsiveness to service failure.
- Community well-being impacts are important to acceptance of the industry and are influenced by perceptions of risk, knowledge and awareness, aesthetics, changed landscape, place identity and attachment, and type of infrastructure.
- Community well-being benefits are viewed in terms of employment benefits and support for the local community.

Wider public

- Low level of awareness and attitudes towards waste, tend to be focussed on service related elements of the sector.
- Trust issues revolve around value for rate payers and recycling outcomes.

2.3 Phase 3: Victorian state-wide survey

In phase 3 of the research project, we conducted a survey on Victorian attitudes to waste management, incorporating the variables identified in the qualitative phase of the research. The survey was conducted online in June 2016, and took approximately 20 minutes to complete. We asked 1,212 Victorians 134 questions about their attitudes, knowledge and behaviour in relation to waste and resource recovery. We also asked them about their views towards living within two kilometres of an imaginary waste and resource recovery complex. We used a 'scenario' to ask about issues such as impacts, benefits, trust, and governance in relation to living near such a site.

SURVEY SAMPLE

Participants were randomly selected, and representative of the Victorian population based on ABS (2015) statistics for age, sex, and geography. We ensured that half the participants lived within a 2 km radius of waste and resource recovery infrastructure. These infrastructure sites were one of the 23 waste and resource recovery hubs considered to be of strategic importance in Victoria's 30 year state waste plan.

The other half of the participants were from across urban and regional Victoria.

SAMPLE: N = 1,212

n = 610 Targeted postcodes

n = 602 Other postcodes

SAMPLE PROFILE

79% Metro: 21% Regional

24% Impacted: 76% Non-impacted

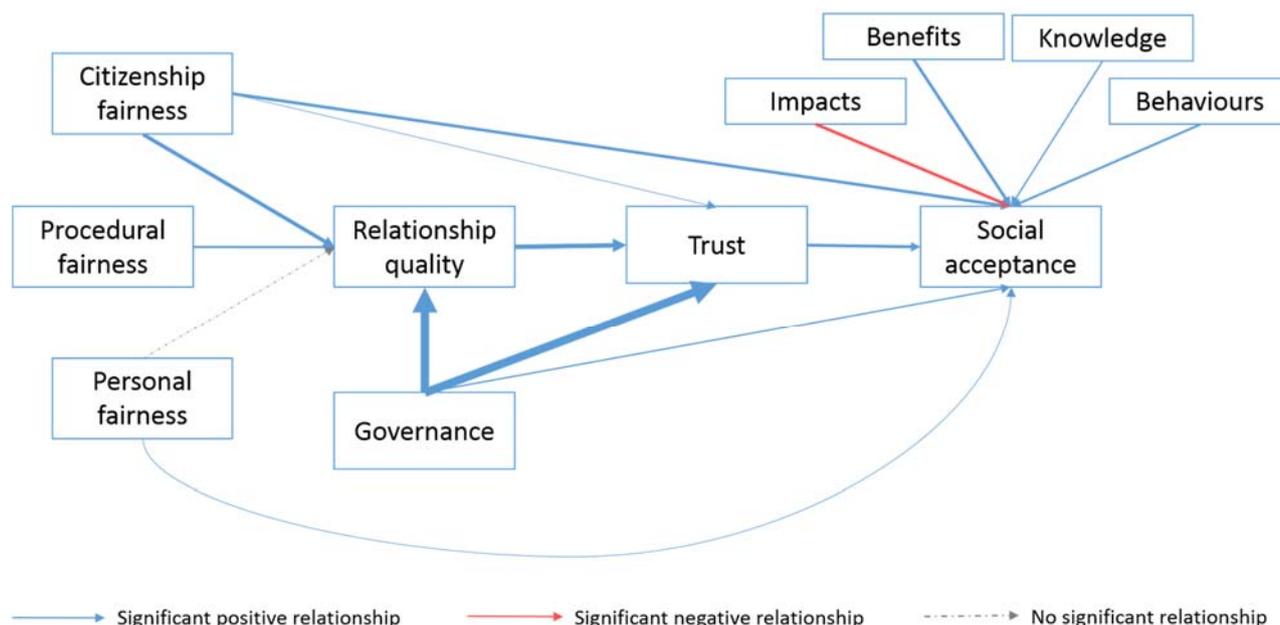
ABS representative - age, gender, geography

SURVEY FINDINGS

Model of trust and social acceptance: Living in the vicinity of a waste complex

The survey measured ten drivers of trust and social acceptance related to living near a waste complex. All drivers were statistically significant predictors of social acceptance. However, some were more important than others as denoted by the thickness of the arrows in Figure 2 (see Appendix A for model statistics).

Figure 2 Model of social acceptance in the waste and resource recovery sector



When people perceived these drivers to be positive or favourable then they are more accepting of waste and resource recovery infrastructure, including living near such infrastructure. It is important to note that ‘Impacts’ acts as a negative driver. The higher the level of concern for impacts, the lower the level of social acceptance. As detailed in Table 3, differences in perceptions existed between those people who actually live near a waste and resource recovery facility (impacted residents) and the wider public (non-impacted residents). Each driver is described in Table 3.

Table 3 Drivers of trust and social acceptance: Description and survey scores - impacted residents and wider public

DRIVERS	DESCRIPTION	AVERAGE SCORES	IMPACTED RESIDENTS	WIDER PUBLIC
Impacts	Concerns about negative impacts (e.g. dust, odour, noise, increased traffic, litter, scavenging birds, and visual impacts)	4.0	3.9	4.0
Benefits – Local	Perceptions of local benefits such as convenient disposal of large household items and waste, local employment/training opportunities, corporate support for community activities	3.5	3.6	3.5
Benefits – Societal	Perceptions of societal benefits such as managing waste generated by society, reducing public health risks, and supporting the Victorian economy	3.8	3.7	3.8
Knowledge	Self-rated knowledge of the waste and resource recovery system	2.7	3.0	2.7*
Behaviours	Self-reported waste reducing behaviours	3.5	3.5	3.4
Fairness - Personal	Perceptions of personal fairness related to NIMBYism concepts	2.6	2.5	2.7*
Fairness – Citizenship	Perceptions of fairness that takes into account wider societal considerations and the ‘greater good’	2.9	3.1	2.9*
Fairness - Procedural	Perceptions of fairness related to decision making processes, citizen voice, and participation such as meaningful two-way dialogue; opportunity to be heard and have a voice; not feeling intimidated or that there are power imbalances in the interactions	3.3	3.5	3.2*
Relationships – Contact quality	Perceptions of relationships between community and the operator, in terms of quality of contact such as open, honest and genuine; and involving community in two-way dialogue	2.8	3.1	2.7*

Relationships - Responsiveness	Perceptions of relationships in terms of responsiveness of the operator to concerns and issues such as timeliness, accessibility, and genuine commitment	2.7	3.1	2.6*
Trust – State bodies	Trust and confidence that the entity (state bodies, local council or local operator) will act responsibly, in the community’s best interests, and has the necessary capability	3.4	3.4	3.4
Trust – Local council		3.1	3.2	3.0*
Trust - Operators		2.8	3.1	2.7*
Governance	Confidence in regulations and compliance for governing activities of waste and resource recovery facilities.	3.4	3.4	3.4
	Perceptions of planning and visioning for the future of the WRR sector	3.3	3.4	3.2*
	Perceptions of stakeholders ‘working together’ to address problems and opportunities	3.2	3.4	3.2*
Acceptance	Living near a landfill	2.9	3.2	2.8*
	Living near a transfer station	3.4	3.3	3.4
	Living near a sorting recyclables facility	3.7	3.6	3.7

Note: Scores have been rounded to one decimal point, Scale 1-5 where 1 = lowest or most negative score and 5 = highest or most positive score except for ‘Impacts’ where 5 indicates the highest level of concern; *indicates a significant difference between impacted and wider public $p < .05$

IMPORTANCE OF DIFFERENT DRIVERS

The top five drivers of social acceptance, based on the statistical size of their effect on acceptance, are listed below. Figure 3 depicts the size of the effect of each driver.

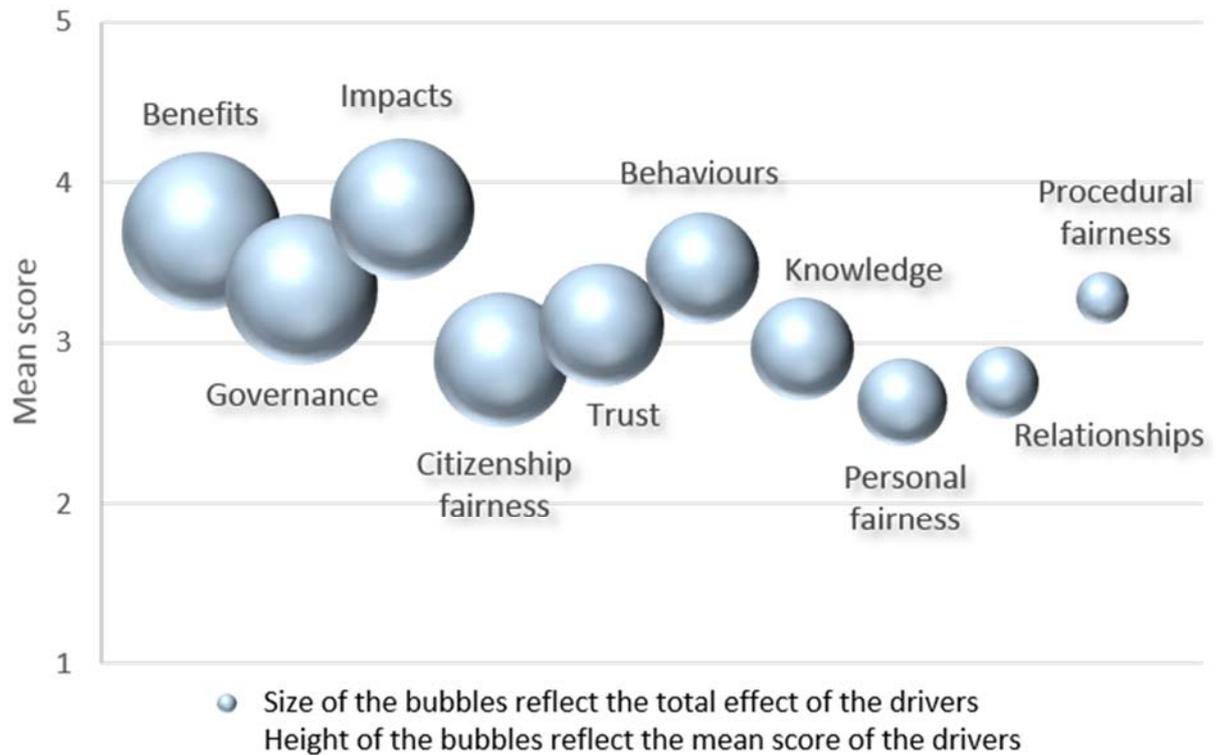
- **Benefits** – perceptions of local and societal benefits
- **Governance** – perceptions of regulation, compliance, planning and visioning, and working collaboratively
- **Impacts** – a range of impacts that affect wellbeing
- **Citizenship fairness** – evaluation of fairness based on wider societal considerations (the ‘greater good’)
- **Trust** – in government and operators to act responsibly, in the community’s interests, and capably

(Table 3 provides a full description of each driver).

Surprisingly benefits was a key driver of acceptance, as well as impacts. This suggests that developing the perceived benefits and value to society of the waste sector can be a major driver for increasing acceptance. Governance, not only in terms of regulations and compliance, but also, in relation to institutional planning and collaborating was also key to acceptance. Governance was also a major contributor to trust. Not surprisingly, perceptions of fairness and trust underpinned people’s acceptance.

As shown in Figure 3, some of the drivers were perceived to be functioning at low levels or viewed quite negatively (i.e. impacts, perceptions of relationships between community and operators, perceptions of personal and citizenship fairness about living near a site, and waste sector knowledge). These drivers were capable of influencing a person’s level of acceptance of living in the vicinity of a waste and resource recovery site, and provide opportunities for targeted programs that could improve such acceptance.

Figure 3 Drivers of social acceptance: Living in the vicinity of a waste complex



2.4 Phase 4: Feeding back results and identifying opportunities for collaborative actions

2.4.1 THE PROCESS – FEEDBACK SESSIONS AND WORKSHOP

In the final phase of the project, three stakeholder events were conducted. Sustainability Victoria led the events as part of the joint CSIRO and SV research project. The objective was to engage industry, government, and community stakeholders to utilise the research findings and identify activities or initiatives that may enhance trust and acceptance for infrastructure within the waste and resource recovery (WRR) sector.

Three events were held during August and September 2016, at the SV offices in Melbourne, and were facilitated by an independent facilitator.

1. Industry and government feedback session (30 August, 9.30am-12pm)
2. Community feedback session (30 August, 5.30pm-8.00pm)
3. Combined community, government and industry workshop, (1 September, 10.00am-1.30pm)

Attendees to the events were drawn from the participating community groups and key informants involved in Phase 2 of the research. A summary of the stakeholder groups represented by attendees at each event is provided in Table 4.

Table 4 Participating stakeholders

1. FEEDBACK SESSION WITH INDUSTRY AND GOVERNMENT	2. FEEDBACK SESSION WITH COMMUNITY	3. WORKSHOP WITH COMMUNITY, GOVT. & INDUSTRY
<ul style="list-style-type: none"> - CSIRO researchers x 2 - Sustainability Victoria x 3 - Environmental Protection Authority x 1 - Metro WRRG x 3 - Private operator representative x 4 - Local council operator representative x 3 	<ul style="list-style-type: none"> - CSIRO researchers x 2 - Sustainability Victoria x 1 - Community reference group representative x 3 - Metro WRRG x 1 	<ul style="list-style-type: none"> - CSIRO researchers x 3 - Sustainability Victoria x 2 - Community reference group representative x 2 - Metro WRRG x 2 - Dep. Environment, Land, Water and Planning x 1 - Private operator representative x 3 - Local council operator representative x 1
Total	16	7
		14

During each of the feedback sessions CSIRO researchers presented a summary of the key findings from the Victorian state-wide survey. The facilitator then asked attendees for their insights, focussing on four discussion topics: 1) surprises from the research, 2) affirmations from the research; 3) challenges, issues, and concerns; and 4) opportunities.

The aim of the workshop was to collaboratively explore and identify initiatives that could build trust and acceptance within communities for the waste and resource recovery sector, thereby providing benefit to both communities and the sector overall.

2.4.2 INSIGHTS

Feedback sessions – Challenges and opportunities

As part of the two feedback sessions community, industry, and government participants were asked to identify possible challenges and opportunities that had emerged from the CSIRO research findings. Using the data from the feedback sessions, we have grouped the challenges and opportunities perceived by participants into four topic areas:

- Planning and policy
- Costs and resources
- Trust, relationships, and acceptance between community and the WRR sector
- Knowledge, attitudes, and behaviour

These perceptions provide useful information to consider when planning and implementing initiatives that can benefit community and the waste and resource recovery sector. The challenges and opportunities identified by stakeholders also inform and support the recommendations of this report. A detailed list of the challenges and opportunities can be found in Appendix B.

Workshop – Possible initiatives

A range of initiatives identified as benefiting community and the waste and resource recovery sector were developed at the one-day workshop led by SV, as part of a joint CSIRO and SV research project, and attended by industry, government, and community participants. The initiatives aim to address the most salient findings from the CSIRO research and were considered the most important and relevant to address by the workshop.

The initiatives support improvements in four main areas:

- Governance
- Knowledge
- Local and Societal Benefits
- Relationship quality

The initiatives represent ideas that could be used to implement the recommendations described in Section 3 of this report, and are detailed in Appendix C.

3 Recommendations

We propose a range of recommendations based on the research findings. We have used the survey results to identify the factors that drive trust and acceptance in the waste sector, and the interview data to understand these issues in more depth. Together the data provides a robust and comprehensive basis for shaping our recommendations.

The recommendations are focussed on achieving outcomes rather than specific outputs. This means, we suggest options for improving the underlying factors contributing to trust and acceptance rather than focus on specific methods or initiatives per se. We recognise that a range of initiatives can be undertaken to address an underlying driver and we have incorporated some examples that were identified and supported by the workshop in Phase 4 (Appendix B details a complete list of the initiatives). However, we acknowledge that final choices around possible interventions, programs to undertake, or policies and standards to modify or augment are the decisions of others who are cognisant of all available information that needs to be considered in such decision making.

When describing the data from the survey we refer to the 'descriptive' findings, which describe the level of peoples' perceptions of these variables in terms of how favourably or positively they view each variable. These are typically described as scores out of 5, where 1 is the least positive and 5 is the most positive. A score below the midpoint of 3 is considered negative or unfavourable on average. We also draw from our modelling data which describes the importance of each variable in explaining trust and acceptance, we refer to this type of data as our path analysis or modelling.

3.1 Rationale underpinning recommendations

Our recommendations target four groups of drivers:

1. Those drivers that impact on the relational components of building trust and acceptance: relationship quality and fairness
2. Those that strengthen and augment governance
3. Those that influence impacts and benefits
4. Those that impact knowledge

Our modelling indicated these drivers increased trust and acceptance if perceived to be high, or alternatively, reduced trust and acceptance if perceived to be low or weak. The exception is impacts, which works as a negative driver of acceptance, such that the higher the perceived impact, the less accepting people tend to be. In most instances our descriptive findings showed people assigned these drivers modest or low scores, except for impacts which were scored more highly, indicating higher levels of concern. Consequently, in forming our recommendations we selected drivers that were important to trust and acceptance yet were perceived to be currently functioning at low to moderate levels. We rationalised that there is room to improve these variables, and once improved this should translate to increased levels of trust and acceptance and wider benefits for the sector. We have also taken into consideration differences reported in our survey between 'Impacted residents' and the 'Wider public' The four groups of variables were identified as potential areas of interest by participants at the Community, Government, and Industry workshop.

3.2 The relational components of building trust and acceptance

For people who live near waste and resource recovery infrastructure or those that interact with the sector, the relational components prove important drivers of trust and acceptance. Essentially the *quality of the relationship* and *feelings of fairness* are key to underpinning relationships built on trust. Trust, in turn, is fundamental to acceptance.

RELATIONSHIP QUALITY

Contact quality

Ensuring the operator has an effective relationship with its community is essential. Interview data indicated adopting a relationship based on genuine two-way dialogue with community and involving community in decision making in some capacity were key to effective engagement. This means going beyond a consultation type approach and progressing dialogue to a point where there is real listening to community inputs and responding in a way that acknowledges community have been heard. This doesn't necessarily mean that operators will always have to agree with community suggestions, rather, involving community through listening to their feedback, concerns, ideas, and suggestions and genuinely responding is important. The literature provides good examples of where communities can handle difficult and negative situations through the process of effective community engagement. The literature is also extensive on the benefits of involving communities in the co-creation of solutions. An example from this research was the experiences described by the Clayton community reference group, where despite a long and difficult process to improve a significant odour issue from a nearby landfill, a community-based reference group was able to take the broader community with them over the two-year process whilst technical solutions could be put in place to reduce the odour problem.

Whilst the benefits of community engagement have been identified in this research, the timing of community engagement is something to consider. At present there are no guidelines to recommend when this should occur and there is a tendency for a community to become involved when there are problems. However, there were many indications in our research to suggest that early involvement of community, prior to issues becoming a problem is worthwhile. The literature also suggests that establishing community relationships from the outset allows relationships to build and trust to be established. Community involvement need not be focussed around problem solving of issues and concerns but could also be addressing how to create benefits that are valued by locals. A benefit oriented focus would also feed into the 'Benefits' driver outlined below.

Recommendation: Relationship quality - contact quality

- Develop guidelines for community engagement within the industry, including when such engagement should commence Ensure that the awarding of all new contracts consider the ability and commitment of the operator to engage effectively with the community
- Consider incorporating some sort of evaluation system or level of evidence to indicate that community engagement is being undertaken and is effective
- Develop skills and capability in the industry around community engagement

Responsiveness

Our research shows relationship quality was also related to responsiveness of the industry to community concerns. This was described in a number of different ways - as following through on what was discussed with community; being available and accessible, particularly to community's concerns about impacts; and responding in a manner that is both timely and reflects a genuine commitment to addressing issues. For some impact issues, timing of responses seems critical in the eyes of community. This stems from some impacts seeming to relate to time and situation specific influences such as wind direction, heat, and rain events.

Communities feel frustrated and not heard when complaints are not followed through in a timely way. Such feelings reduce perceptions of the quality of the relationship and ultimately drive down trust in the operator. These perceptions can also extend to the wider waste sector including dealings with local councils or state regulators, which in turn impairs trust in these entities and reduces acceptance of the overall sector. Descriptive findings show that current perceptions of operator responsiveness for impacted residents are at low levels (3.1 out of 5), even though this is higher than perceptions in the wider non-impacted public (2.7 out of 5). This suggests that there is impetus to improve operator responsiveness across the sector.

Recommendation: Relationship quality - responsiveness

- As an industry, develop and share ideas around best practice for supporting responsiveness to issues.
- Operators to consider their accessibility to their local communities taking into consideration English language barriers to local contact points (e.g. call centres and websites).

FAIRNESS

Fairness underlies relationship quality. Interview data indicated a sense of fairness refers to impacted residents feeling they are treated fairly and with respect by operators and government such as the EPA and local councils. This means that they are provided with opportunities and processes to be heard and their concerns listened to (procedural fairness). It also refers to an understanding of the wider societal considerations when planning and managing the waste and resource recovery sector and how this relates to their local waste and resource management facilities (citizenship fairness).

Recommendation: Fairness

- Develop industry guidelines on procedures and processes which include concepts of fairness and grievance management for community engagement among relevant stakeholders. This could also incorporate notions of context-specific processes related to fairness that may need to be negotiated.
- Promote an understanding among residents of the wider societal reasons and benefits for the siting of their local waste and resource recovery facility.

To the wider public, who do not have such direct relationships with the waste operator, trust and relationship quality are going to be determined by other factors such as reputation of the operator and the industry, physical appearance of the precinct, customer service, and professionalism of the employees. Our

research shows that trust is also driven by perceptions of the capability of the operator and the industry. The survey findings showed that current levels of trust for the industry by the wider public were negative on average (2.7 out of 5). This was in contrast to the trust levels of impacted residents who have modest levels of trust in local operators (3.1 out of 5).

Recommendation: Relationship Quality – wider public

- Improve the image of the industry by increasing the public promotion of good news stories, showcasing best practice operators, benchmarking, and by increasing the innovation, effectiveness, and physical appearance of the industry.
- Greater recognition and reward for innovative solutions to showcase best practice.

3.3 Governance

Strong governance underpins peoples' perceptions of trust and acceptance of the industry. This can be in the form of monitoring, ensuring best practice, planning and visioning an innovative future, and demonstrating that stakeholders can effectively work together. It is important that people's confidence is high in government, councils and industry to comply and regulate, plan and vision, and work together effectively. Results showed that for each of these components there were only modest levels of confidence in governance (compliance and regulations 3.4 out of 5; planning and strategic vision 3.3 out of 5; collaboration among stakeholders 3.2 out of 5). The more capable stakeholders are in these areas the higher peoples' levels of trust, satisfaction with relationship quality, and ultimately likely acceptance.

Our research showed that people perceived the awarding of WRR contracts as dominated by cost considerations, thus potentially reducing best possible outcomes. Cost pressures are also perceived to be exacerbated by rate capping for local governments, which may limit their ability to afford more expensive, but perhaps more environmentally and socially sustainable options. Lower cost options for local councils may not be the most effective options in the longer term, nor for building trust and acceptance in the WRR industry. Lower cost options may also handicap the adoption of newer technologies, and inadequately take into account other benefits like environmental, health, and community benefits. Establishing key criteria for procurement of WRR services would help to ensure more effective and innovative WWR infrastructure that is aligned to Victoria's 30 year state waste plan.

Recommendation: Governance

- Establish key criteria for procurement of WRR services that incorporates both monetary and non-monetary costs and benefits over the longer term and in line with Victoria's 30 year state waste plan.
- Ensure that future contracts are not determined solely on a cost basis and that other considerations are given to the sustainability factors that are important for building trust and acceptance in the industry, for example operator capability and commitment to community engagement, training of operational staff, physical attributes of the precinct, and preparedness to provide additional benefits to the local community.
- Develop a transparent sector-wide reporting and monitoring program that is accessible to all stakeholders, complementing and aligning with EPA initiatives and state government strategic plans.

3.4 Impacts and Benefits

REDUCING IMPACTS

Our research identified fourteen types of impacts associated with WRR complexes, all of which were of concern to impacted and non-impacted residents, especially odour, illegal dumping, and environmental and health concerns. Many of these need to be addressed individually on a case by case basis incorporating transparent processes and open and honest relationships between the community, local operators, and the Environment Protection Authority.

Impacts can also be indirectly reduced by ensuring that adequate buffers are maintained, that best practice approaches are adopted by all operators, and that innovative solutions are supported and encouraged. In addition, broader societal changes that result in reducing the amount of waste going to landfill, particularly organic waste, will indirectly help to reduce the impacts experienced by local communities.

Recommendation: Impacts

- Consideration be given to protecting specified buffer zones around WRR sites.
- Continue and strengthen initiatives for reducing waste from wider society going to landfills.

INCREASING BENEFITS

Local benefits

Research indicated that when local communities perceived there to be local benefits associated with the landfill they were more accepting. Apart from a few examples, our research found there has been few initiatives dedicated to developing and highlighting local benefits. Our findings indicated that local employment opportunities, local training opportunities, programs linked to local school programs, support for local teams, were all examples of providing local benefits. However, this is relatively underdeveloped. It is important to emphasise that benefits need to be developed locally because experience in other industries suggest that giving money for programs or activities not aligned with what a community values, will not establish acceptance on its own.

Recommendation: Benefits – local benefits

- Support operators to identify and share different ways that they provide local benefits.
- Encourage community reference groups and operators to actively consider local benefits as well as impacts.
- Encourage operators to engage local community in co-creating benefits that would be valued by their local community.

Societal benefits and industry knowledge

Our research identifies that when people feel there is a wider societal benefit or value in what the industry achieves or contributes then they are more accepting. The literature indicates that the waste sector is socially hidden from most people, as reflected in this present research, with low levels of knowledge about the overall WRR system among Victorians surveyed. Our results suggest that people do not think about the waste sector beyond putting litter in bins or sorting recycling.

Our research also shows that the wider public portion of our sample had low levels of understanding about the waste sector beyond waste collection services, particularly around landfills and the use of recycled materials in new products, yet this type of understanding was important to trust and acceptance. It also showed that residents who had visited a WRR site in the last few years or who were associated with a community group engaging with a WRR site had greater levels of self-assessed knowledge of the overall WRR system, and higher levels of acceptance.

People are more likely to appreciate the wider societal benefits of the industry when they are aware of its contribution to society, and what it achieves on a broader scale. Although our research indicated that citizens view the waste sector as essential they may not necessarily see the full value in what it does. However, when they do see these broader benefits they are more trusting and more accepting of the industry.

Recommendations: Benefits – societal benefits

- As a sector develop different ways of demonstrating the value of the industry and to increase peoples' awareness of the industry's contributions to broader society. For example, this could be achieved through awareness campaigns, education programs, different types of messaging, benchmarking, recognition, and site visits.

3.5 Knowledge

As discussed above, knowledge of the sector appears to support acceptance. However, in addition, knowledge also increases waste reducing behaviour. Results from our survey showed that when people have higher levels of understanding of the waste and resource recovery sector they are more likely to engage in waste reducing behaviours. There are many ways to improve knowledge of the sector. However, knowledge needs to go beyond recycling and sorting, as our research suggested that knowledge of the other components of the sector were very weak, particularly landfills. Targeting this area can help to improve acceptance of the industry.

Recommendations: Knowledge

- Develop initiatives that increase knowledge and understanding of the waste and resource recovery sector at a broader level.
- Enhance Victorians' understanding of the WRR sector and the importance of infrastructure and related services.

3.6 Baseline measures, monitoring and goal setting

The results of our research provide a wide range of robust baseline measures for measuring the effectiveness of interventions and establishing realistic goals. For example, a goal to move the 34% of Victorians who would 'reject' living in the vicinity of a WRR site to a more tolerant view of the sector seems reasonable. Baseline measures for all the main constructs that underpin trust and acceptance are available in the full report for the survey phase of the research (McCrea et al., 2016), including measures for all the individual survey items reported by 'Impacted residents' and 'Wider public', and also for 'Regional Victoria' and 'Metropolitan Victoria'.

The survey results also identified current levels of various waste reducing behaviours that people reported undertaking in their homes, and the socio-psychological drivers of these activities. Whilst such results were not discussed in this final project report they can be used to underpin decisions and design for a range of programs and interventions aimed at reducing household waste going to landfill. The survey results relevant to waste reducing behaviour can be found in the full report for Phase 3 (McCrea et al., 2016).

3.7 Gaps in knowledge and possible future research

COMPARISON WITH OTHER STATES

This research establishes industry benchmarks and a sound understanding of community trust and acceptance of the WRR industry in Victoria. These measures and understandings can be easily applied to other states and territories with potential learnings associated from other governance structures and industry practices in other states and territories. This project is potentially the first step in establishing national benchmarks facilitating social acceptance in the WRR industry.

SITING A NEW FACILITY

The research has targeted existing waste sites and factors supporting ongoing trust and acceptance. However, it is unclear if all these variables would play out to the same extent if acceptance was in relation to siting a new facility. Our insights from the wider public component of the sample indicate that the factors would be broadly similar, although other factors may come into play. For example, in siting a new site the potential impacts may be interpreted as unacceptable perceptions of risks. Similarly relationship quality may be untested, but the reputation of the operator or the industry may act as a proxy for actual experiences with the operator. Organised community resistance is also more likely before approving a new or expanded site. Understanding these factors would be important if new sites were planned. Therefore, one recommendation would be to continue to work towards establishing data around possible health or environmental risks and monitor such risks in an open and transparent way. This type of information can be used to allay fear, and escalation and amplification of risk around new sites.

ACCEPTING A NEW TECHNOLOGY

Similarly, acceptance of new technology would bring with it potentially new elements or modifications to the existing group of variables, and the path analysis model. Depending on the characteristics of the new technology, such introduction would warrant additional research.

HAZARDOUS WASTE

Hazardous waste was not examined in this research and potentially alters the importance of the variables responsible for building trust and acceptance. Further research to understand the perceptions of risk and how risk is amplified when dealing with hazardous waste would be worthwhile, bringing new and important insights about social acceptance of the waste and resource recovery industry.

REAL-TIME FEEDBACK

Providing real-time community feedback to waste operators provides an opportunity for improving responsiveness, relationship quality, and a sense of fairness associated with community feeling they are being heard. In addition, real-time feedback allows operators to understand the impacts of their activities and the effectiveness of various interventions they may undertake. CSIRO now has the capability to conduct such research. This type of feedback could be site specific and conducted over a number of months to collect valuable longitudinal data.

Appendix A Model statistics for social acceptance

The model of social acceptance fitted the data very well (normed Chi-squared = 3.3; RMSEA = .04; SRMR = .01), explaining 48.0% of the variation in social acceptance, 67.1% of the variation in trust, and 56.2% of the variation in relationship quality. The standardised betas in Apx Table A.1 shows the relative strength of the direct predictors of social acceptance, trust and relationship quality.

Apx Table A.1 Strength of direct predictors for social acceptance, trust and relationship quality

PREDICTED	PREDICTORS	STANDARDISED BETA	SIGNIFICANT (P <.05)
Acceptance	Trust	0.18	*
	Governance	0.11	*
	Impacts	-0.21	*
	Benefits	0.20	*
	Knowledge	0.10	*
	Behaviours	0.13	*
	Citizenship fairness	0.21	*
	Personal fairness	0.08	*
Trust	Relationship	0.31	*
	Governance	0.54	*
	Citizenship fairness	0.07	*
Relationship	Governance	0.51	*
	Citizenship fairness	0.26	*
	Personal fairness	-0.03	
	Fairness procedural	0.12	*

Note that significant predictors (p <.05) are bolded

Also see Figure 3 Drivers of social acceptance: Living in the vicinity of a waste complex' for a presentation of the strength of direct and indirect predictors of social acceptance.

Appendix B Opportunities and challenges

As part of the two feedback sessions community, industry, and government participants were asked to identify possible challenges and opportunities that had emerged from the CSIRO research findings. We have grouped the challenges and opportunities perceived by participants into four topic areas:

- Planning and policy
- Costs and resources
- Trust, relationships, and acceptance between community and the WRR sector
- Knowledge, attitudes, and behaviour

These perceptions provide useful information to consider when planning and implementing initiatives that can benefit community and the waste and resource recovery sector. The challenges and opportunities identified by stakeholders also inform and support the recommendations of this report.

Apx Table B.1 Challenges and opportunities identified by feedback session attendees

CHALLENGES, ISSUES & CONCERNS	OPPORTUNITIES
Planning and policy	
<ul style="list-style-type: none"> • Protecting buffer zones/urban fringe development • Impact on industrial land buffers • Lack of a long-term view, and future approaches or alternatives to waste management • Lack of alignment between Regional Implementation Plans and 30 year strategy • Influence of short-term political cycle on governing bodies • Attracting private investment 	<ul style="list-style-type: none"> • Better waste contracts including waste reprocessing and recycling included in contracts to consider waste disposal • Building trust between industry and government to reduce risks associated with investment • Deepen the conversation on where the waste and resource recovery system should go in terms of future options • Investment in resource recovery, diversion, closing regional landfills • Someone to take the initiative to penalise excess packaging– APC needs stronger influence • Building design that optimise waste and resource recovery • State Government purchasing policy
Costs and resources	
<ul style="list-style-type: none"> • Local councils’ capacity to pay and recover costs • Rates capping • Willingness to pay? How much? • Insufficient financial and human capital to be effective • Uncertainty surrounding Levy increases 	<ul style="list-style-type: none"> • Future research to explore what people are willing to pay • Understanding economics of waste flows across the city • Separating waste services out of rate capping
Trust, relationships and acceptance	
<ul style="list-style-type: none"> • Negative public image/perception of the sector • Low levels of trust in the sector 	<ul style="list-style-type: none"> • What benefits are important to residents? Traineeships? Sponsorship?

- Perceived conflict of interest for bodies responsible for facility operation and planning approvals
- Transparency of operators – agenda to be profitable
- Finding someone you can talk to about the issues– instead of the faceless truck driver
- Commercial-in-Confidence information and data restrictions
- Should be able to trust operators without relationships - this is the role of Governance
- Two-way trust in community reference group needs to be present – How do you build two-way trust?
- Changing community from a state of rejection to toleration of facilities
- More accurate representation needed of potential risks and waste volumes generated
- What are the predictors of waste as an essential service?
- Why are some impacted and others not when both live near landfills?
- How do we involve community in broader waste and resource recovery conversation? Now and in the future?
- PR for the sector– what’s great, essential
- Make data accessible
- Keep EPA trajectory around improved perception–brand, visibility, presence– in an upward climb. The last five years it has improved.
- Understanding community’s knowledge will be important in community engagement activities
- More interaction and better relationships
- Links between community expectations and those between Local Government priorities and investment
- Two-way street to develop trust–and where information is shared make sure it is respected and secure

Knowledge, attitudes and behaviour

- Communicating the benefits to the community
- Education of the role of landfill in the waste system and education of community on alternative technologies
- Community apathy towards landfill – NIMBY and lack of interest
- Make changes to consumer habits and behaviours
- Making it easy to reduce waste at work and ensure effective cleaner behaviour as well
- The more connected someone is to the system to more engaged and accepting they are
- Benefit of local drop-off facility
- Public place recycling in recreational facilities
- Increase community knowledge around the system
- Enhancing public place recycling through bin design and labelling for clarity
- Outbound school education to drive family and community waste behaviour
- Focus on the question “when does it stop being my waste?”
- Make people aware of the waste system and make it important
- “Follow your waste”– site visits to build knowledge and trust
- PR for the sector– what’s great, essential
- Tie in liveability of Melbourne/Victoria and our waste system

Appendix C Possible initiatives

A range of initiatives identified as benefiting community and the waste and resource recovery sector were developed at a one-day workshop led by SV, as part of a joint CSIRO and Sustainability Victoria (SV) research project, and attended by industry, government, and community participants. The initiatives aim to address the most salient findings from the research and were considered the most important and relevant to address by the workshop. The initiatives represent ideas that could be used to implement the recommendations described in Section 3 of this report.

The initiatives support improvements in four main areas:

- Governance
- Knowledge
- Local and Societal Benefits
- Relationship quality

Apx Table C.1 Possible initiatives identified by feedback session attendees

POSSIBLE INITIATIVES - GOVERNANCE	
Outputs	Activities and stakeholders
<ul style="list-style-type: none"> • Create community, WRRG, Industry partnerships • Industry developing a transparent reporting and monitoring program that is open to all stakeholders • Setting and clarifying key criteria for procurement for alternative waste technologies 	<ul style="list-style-type: none"> - Setting up partnerships between community, operators / industry, WRRGs and SV - Funding for meetings and initiatives e.g. feasibility studies - Selecting indicators - Websites - Easy to find and accessible - Data freely available - Working with community, operators / industry, WRRGs, SV, local government and EPA - Using partnership groups to set criteria - Determining the most appropriate criteria where costs does not dominate - Whole of Life costing including benefits - Working with community, operators / industry, WRRGs and SV
POSSIBLE INITIATIVES - KNOWLEDGE	
Outputs	Activities and stakeholders
<ul style="list-style-type: none"> • To increase knowledge of the waste and resource recovery sector • Statewide education program to partner local government, industry and state government to engage with the community 	<ul style="list-style-type: none"> - SV and WRR portfolio - Design and deliver a program with local governments and planning authorities on the waste and resource recovery sector and the planning issues that exist to feed down to the local government level - this may include consumer affairs - Community including schools - Roadshow to deliver information sessions on waste and resource recovery system - Planning departments and local planning authorities (to understand the importance of buffers), VCAT and Consumer Affairs - Local government - Proactively engage and educate the community on the WRR system

on the WRR system (collection, treatment, disposal, new technology).

- To enhance Victorians’ understanding of the WRR sector and the importance of infrastructure/ services.

- First point of contacts with community
- Collect revenue

Whole of Government

- Setting policy
- Guidelines on what is the narrative for the Victorian WRR system both now and in the future
- Funding
- Consulting with industry and local governments
- Advertising/communications/campaign

Industry

- Involve/work with local government and state government
- Roll out programs
- Work with local government
- Funding

POSSIBLE INITIATIVES – LOCAL BENEFITS

Outputs

- Local employment in the community
- Develop a career path
- Purpose-built aligned training programs

Activities and stakeholders

Business/industry

- Create employment pathways and career paths
- Collaborate with training bodies and set standards

Local Community

- Input into training needs

Local Government/State Government

- Awareness; Facilitation; Promotion of benefits

POSSIBLE INITIATIVES – SOCIETAL BENEFITS

Outputs

- Performance measurement and continuous improvement
- Promoting the benefits of the waste sector as a whole

Activities and stakeholders

Industry

- Site information - performance and benefits
- Success stories; Opportunities

Government

- Global comparative messaging
- KPI/policy implementation plan - trust

Media/NGO

- Promotion of success - what if we did not do this?
- Advocate on integration and improvement
- Provides independent checks and balances

POSSIBLE INITIATIVES – RELATIONSHIP QUALITY WITH THE WIDER PUBLIC

Outputs

Industry image initiatives

- Improve public perception of image
- Increase self-image of employees
- Increase pride working in the industry
- Improve public image - lifting profile image

Activities and stakeholders

Industry

- Internal training
- Physical amenity improvements and improved public spaces
- Associations – sharing ideas and annual awards
- Truck suppliers involved in sponsorship
- Supply chain involvement

Metro and regional groups

- Accessible Data about industry

SV

- Environmental awards - Waste category
 - Program to influence behaviour of rogue operators to improve or opt out of the industry
 - Working with industry (individual operators, companies, local government) associations, WRRGs and public
-
- Industry and community improving visibility of the industry to community
 - Be proactive and responsive
- Hotline
 - Open days/tip parties
 - Responsive to any query
 - Program communications irrespective of problems or not
 - Case studies for other operators
 - Toolkit to be used
 - Working with communities, industry, WRRG and EPA
-

References

McCrea, R., Walton, A., Jeanneret, T., Lacey, J., and Moffat, K., (2016). *Attitudes and social acceptance in the waste and resource recovery sector*. CSIRO, Australia.

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