GMCA GREATER MANCHESTER COMBINED AUTHORITY

Greater Manchester Combined Authority

Date: 15 December 2023

Subject: Investment in new Waste Mechanical Sorting Infrastructure

Report of: Councillor Tom Ross, Green City Portfolio Leader

Purpose of Report

To set out proposals for investment in recyclate sorting infrastructure to meet the requirements of the national Resources and Waste Strategy for consistency of collections (now referred to as Simpler Recycling) and to enable the collection for recycling of additional materials at the kerbside.

Recommendations:

GMCA is recommended to:

Review the options appraisal and approve the recommended approach for the future investment in recyclate sorting infrastructure.

Contact Officers

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Equalities Impact, Carbon and Sustainability Assessment:

Recommendation - Key points for decision-makers

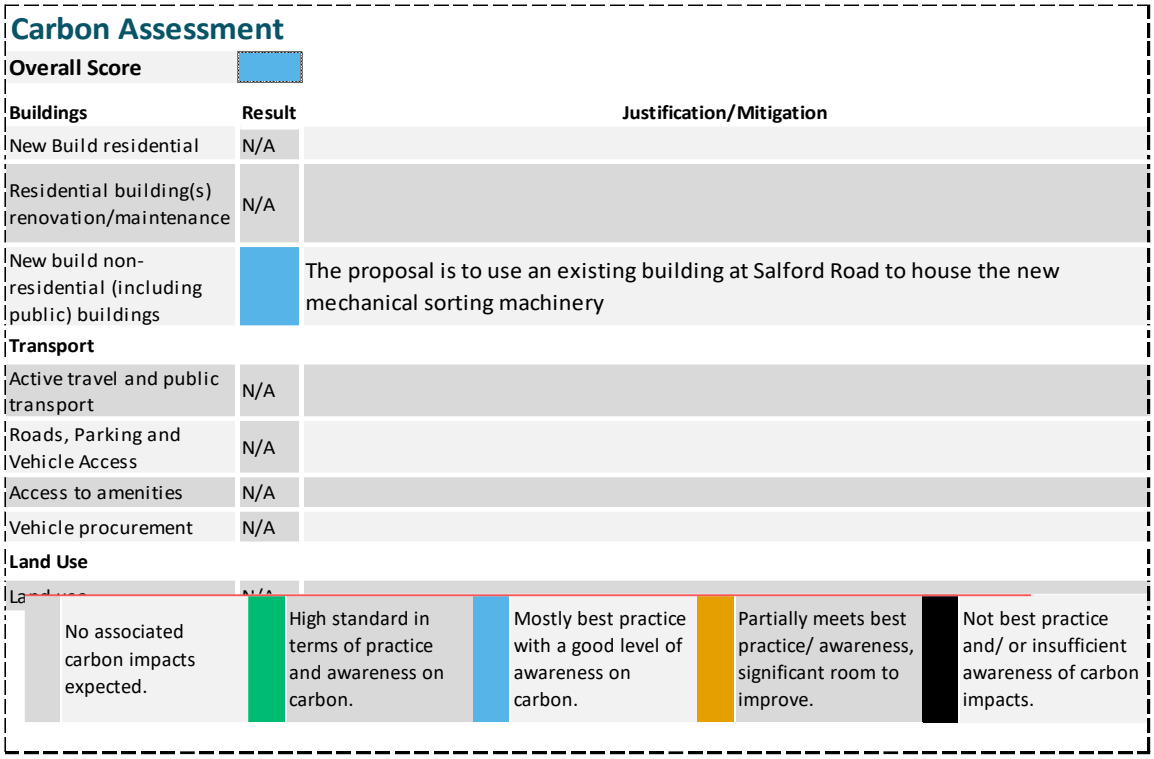
To approve the use of reserves to fund the investment in recyclate sorting infrastructure and to delegate to the Chief Executive GMCA and TfGM the conclusion of documentation to initiate a procurement process and the agreement of a Notice of Change for the ongoing operating costs with the contractor.

Impacts Questionnaire

Impact Indicator	Result	Justification/Mitigation
Equality and Inclusion		
Health		
Resilience and Adaptation		
Housing		
Economy	G	
Mobility and Connectivity		
Carbon, Nature and Environment	G	
Consumption and Production	G	
Contribution to achieving the GM Carbon Neutral 2038 target		

Further Assessment(s): Carbon Assessment

G	**Positive impacts overall, whether long or short term.**	A	**Mix of positive and negative impacts. Trade-offs to consider.**	R	**Mostly negative, with at least one positive aspect. Trade-offs to consider.**	RR	**Negative impacts overall.**



Carbon Assessment

Overall Score		
Buildings	**Result**	**Justification/Mitigation**
New Build residential	N/A	
Residential building(s) renovation/maintenance	N/A	
New build non-residential (including public) buildings		The proposal is to use an existing building at Salford Road to house the new mechanical sorting machinery
Transport		
Active travel and public transport	N/A	
Roads, Parking and Vehicle Access	N/A	
Access to amenities	N/A	
Vehicle procurement	N/A	
Land Use		
La	N/A	

Risk Management

The English Resources and Waste Strategy and its implementation has been captured in the GMCA's Strategic Risk Register with the necessary mitigations actions identified.

Legal Considerations

Legal considerations of any consequences of undertaking actions contrary to the English Resources and Waste Strategy are captured within the report and have been more specifically considered in the Review and Options Appraisal processes carried out by external consultants WSP.

Financial Consequences – Revenue

Financial Revenue considerations are captured within the report.

Financial Consequences – Capital

The central purpose of the English Resources and Waste Strategy (RaWS) RaWS is to create a circular economy principally through products being designed for recyclability, improved labelling, fewer plastic polymers being used for packaging and a plastic packaging tax. Facility capital costs to accommodate these changes are outlined at point 3.3 and are subject to detailed inspection of the IVC building, remedial works specification and procurement for a technology provider and construction contractor. Capital implications are set out in section 6.0.

Number of attachments to the report: 0

Comments/recommendations from Overview & Scrutiny Committee

N/A

Background Papers

- Waste Strategy Update – Part A Waste and Recycling Committee 15th March 2023
- Resources and waste strategy for England - GOV.UK (www.gov.uk)
- Near elimination of biodegradable waste to landfill - GOV.UK (www.gov.uk)
- Consistency in Household and Business Recycling in England - Defra - Citizen Space
- Extended Producer Responsibility for Packaging - Defra - Citizen Space
- Introducing a Deposit Return Scheme in England, Wales and Northern Ireland - Defra - Citizen Space
- The GMCA's combined and submitted responses to the EPR, DRS and Collection Consistency consultations – available from the Contact Officer

Tracking/ Process

Does this report relate to a major strategic decision, as set out in the GMCA Constitution

Yes

Exemption from call in

Are there any aspects in this report which means it should be considered to be exempt from call in by the relevant Scrutiny Committee on the grounds of urgency?

No

GM Transport Committee

N/A

Overview and Scrutiny Committee

Briefing note provided in November 2023

1. Introduction/Background

The existing Materials Recovery Facility (MRF) located at Longley Lane, Sharston has been operational since 2013 and processes c.90ktpa – 100ktpa of kerbside collected dry, mixed recyclable materials (referred to as commingled collections). The input specification for the commingled collections is based on glass, plastic bottles, ferrous and non-ferrous cans, aluminium foil and aerosols. Plastic bottles are sorted using near infrared (NIR) separation equipment into High Density Polyethylene (HDPE), Polyethylene Terephthalate (PET) and a low grade mixed plastic stream.

The facility is the only MRF that GMCA operates so maintaining facility availability is critical to continuity of collection services. The plant is now 10 years old and is showing age related issues due to the abrasive nature of the glass containing feedstock which wears away protective coatings on the steel work resulting in corrosion and metal fatigue. The NIR sensors are also prone to 'blinding' by debris which affects the efficiency of the separation process leading to additional downtime while systems are cleaned.

GMCA has only accepted plastic bottles in the commingled collections due to a lack of sustainable markets for other dense plastics such as pots, tubs and trays (PTTs) despite many other local authorities collecting these materials. Collection is only one part of the waste management chain and the onward marketing and processing of these materials is where the issues arise. In order to separate out the different plastic polymers that make up PTTs, additional processing is required at a Plastics Recovery Facility (PRF). There are currently 7 such facilities in the UK with annual capacity of 350kt as compared to the 572ktpa of plastic packaging collected for recycling by local authorities. This means that a proportion of the PTTs collected for recycling by local authorities are not actually being recycled due to insufficient sorting capacity in the market. Instead these PTTs collected by local authorities will be destined for energy from waste or export and an uncertain fate overseas.

For those PTTs that are processed at a PRF, the individual plastic polymers (HDPE, PET, PP etc) are then sold onto intermediate processors that will wash and flake the plastic. This creates a product that can then be sold onto packaging manufacturers. There are many stages in the recycling chain from the point of collection to actual product manufacture. It is estimated that there is plastic reprocessing capacity in the UK of 900ktpa as compared to 1300ktpa of total plastic packaging collected from local authority and commercial sources. This shortfall needs to be addressed to avoid exports and loss of material from the system and to ensure that the UK can meet minimum recycled content requirements in new packaging.

1.1 National Resources and Waste Strategy (RaWS)

The Department for Environment, Food and Rural Affairs (Defra) has been consulting on the national Resources and Waste Strategy (RaWS) over the last 4 years with a series of prolonged delays in publishing consultation responses. Activity has recently stepped up and details of what is proposed and the potential changes that may be needed for both waste collection and disposal arrangements in GM are now starting to become clearer although cost recovery and other fundamental points are yet to be developed. The central purpose of the RaWS is to create a circular economy principally through products being designed for recyclability, improved labelling, fewer plastic polymers being used for packaging and a plastic packaging tax. All of these measures are intended to make recycling easier, to stimulate demand and create markets for PTTs and to reduce consumption of resources.

1. There are 4 main elements to the RaWS:

    - Deposit Return Scheme (DRS) – reverse vending machines to be rolled out from 2025 at retail premises which will accept in scope drinks containers;
    - Extended Producer Responsibility (EPR) – any organisation placing packaging on the market will be charged a fee according to type and quantity of packaging. The fees will form a fund from which local authorities involved in the management of packaging materials will receive payments. The EPR scheme was timetabled to come into effect from April 2024 but this is now delayed until at least 0ctober 25 (see below for further details);
    - Consistency framework for waste collections (now referred to as Simpler Recycling following the Prime Minister's speech on 20th September 23 that removed the requirement for separate collection) which sets out the types of materials to be collected from the household; and
    - Collection of food waste on a separate, weekly basis from 100% of households from April 2026.

2. The latest element of the RaWS which has been published is the consultation response on Simpler Recycling. Under these proposals, it appears that all local authorities will be obligated to collect additional materials at the kerbside from 2026 which will include pots, tubs and trays and (from 2027) plastic films/soft flexible plastics. The consultation response also included 2 further consultations on the guidance and implementation of Simpler Recycling, so the complete picture remains unknown at this stage. There are

currently limited markets for plastic films with some supermarket take back schemes in operation but very little of this material is collected at the kerbside. Mechanical sorting technology is now starting to be introduced that can separate films from commingled collections meaning that with the right infrastructure, collection is becoming a possibility. Chemical recycling of this material whereby it is split back down to the constituent hydrocarbons that can the used as raw materials for new packaging products is the recommended outlet. Other changes will require liquid cartons (Tetrapak) to be collected with plastics whereas these are currently included in the mixed paper and card stream in GM.

3. The DRS is due to be introduced in England by October 2025 and this will target aluminium and PET drinks containers in the 50ml to 3 litre size range. Defra modelling forecasts that 90% of these materials will be recovered via DRS which will remove tonnage from the commingled collections at the kerbside. Overall, these changes are forecast to significantly change the composition of commingled collections which in turn will affect the operation and efficiency of the MRF.
4. In July 2023, Defra announced that it will be delaying the implementation of EPR until at least October 25 and has yet to confirm when any further details on Simpler Recycling will be issued. The ongoing delays and lack of full details are raising significant uncertainty within the waste industry as to whether the RaWS will be implemented in its current proposed form and when it will be necessary to have infrastructure in place to meet the policy requirements.
5. Due to the delays and uncertainty, many local authorities are waiting to see what the final policy will look like before making changes to their collection or sorting infrastructure. This means that once clarity is provided there will be a rush to appoint contractors and for investment in facilities to be made leading to constraints in the technology supply and construction markets. It is therefore essential to move quickly on decisions relating to investment in treatment capacity and to establish links with reprocessors and end markets for these additional materials.
6. Another future policy initiative that will affect waste management is the Emissions Trading Scheme (ETS) that is proposed to come into effect in 2028 and will include energy from waste (EfW) facilities. Combustion of 1 tonne of residual waste in an EfW facility results in c. 1 tonne of carbon being released via the flue stack. Under the ETS, EfW operators will need to pay for fossil fuel-based carbon emissions at the carbon trading price and will seek to pass these additional costs onto their customers. Modelling shows that these costs will add c.£30 - £40 per tonne to an EfW gate fee and this figure

will fluctuate according to the carbon trading price at the time so could go much higher than the modelled figure. One mitigation that can be employed to reduce the cost impact of the ETS is to seek to reduce the amount of fossil-based carbon i.e. plastics, in the residual waste processed at EfW facilities. Recovery of PTTs and soft plastics/flexibles will therefore reduce exposure to the ETS.

7. Given these incoming policies and the impact on changes to waste composition and potential technology supply constraints, it is necessary to review the current MRF process now to determine whether it can be adapted to operate on the changing mix of materials or whether an alternate approach may be required. Consequently, GMCA has commissioned WSP to conduct a technical review of the facility and to develop an options appraisal for future service delivery. This report sets out the considerations and makes a recommendation on how to deliver a flexible service that can accommodate future changes in waste composition and quantity.

2. WSP MRF Review

The WSP review was based on a series of site visits and a modelling exercise which examined the changes in the commingled collections delivered by districts to GMCA based on the planned quantities of various waste types being collected in the commingled collection; the impact that the revised tonnages will have on the existing MRF; and a recommendation on the future design parameters for any new MRF.

The commingled tonnages have been modelled over a 10 year time frame and a number of factors have been considered that would impact the commingled waste stream, including:

- Inclusion of PTTs and soft plastics;
- Impact of DRS;
- Household growth; and
- Impact of educating residents on what can/cannot be recycled.

The modelling exercise generated the following predicted waste flows:

Waste Type	**Year 1**	**Year 2**	**Year 5**	**Year 10**
Liquid cartons	547	547	708	860
All packaging film	5,556	5,556	8,282	10,871

Carrier bags	1,681	1,681	2,497	3,272
All other non-packaging film & wrap inc. Refuse sacks	2,085	2,085	3,095	4,055
All plastic bottles	15,470	13,150	12,490	12,074
All plastic pots, tubs & trays (PTTs)	8,128	8,128	10,730	13,434
All glass bottles & jars	52,908	52,908	56,957	61,176
All other glass	2,036	2,036	2,192	2,354
Tins & cans, aerosols	11,918	8,939	8,981	8,957
All foil	510	510	549	590
All other metals ferrous	1,318	1,318	1,419	1,524
All other metals non-ferrous	108	108	116	125
Non-targeted materials	18,019	18,019	17,551	17,048
Total Commingled Recyclables collections	**120,285**	**114,985**	**125,567**	**136,340**

The modelling demonstrates that the commingled collection is expected to collect around 136,000 tonnes per year once fully embedded. This is significantly higher than the design capacity of the existing MRF facility, principally due to adding plastic film and PTTs to the targeted materials. The existing plastic separation systems at the MRF are not designed to capture additional plastic types and film capture requires specialist air classification technology not installed at the facility.

Based on the modelling outcomes, the existing MRF at Longley Lane will not be able to process this quantity of material, will require very significant modifications to process the additional targeted material streams, and would require significant additional third party capacity (c. 45,000 tonnes per year) to be contracted. The options for future MRF processing were then reviewed and considered against the mix of materials and quantities set out in the table previously.

3. Options Appraisal

The WSP options appraisal considered the following MRF options to accommodate the forecast increase in the commingled stream tonnage and changes in composition:

1. Retain Longley Lane MRF with extensive modifications;
2. Refurbish Bredbury IVC building and install MRF processing equipment;
3. Refurbish Salford Road IVC building and install MRF processing equipment; and
4. Develop Nash Road with a purpose built new MRF.

3.1 Option 1 – Retain Longley Lane MRF with extensive modifications

The current Longley Lane MRF would require extensive modifications to process the increased volume and to separate the additional materials. The current MRF has the capacity to process c.90,000 tonnes per year, sorting out 6 materials (glass, ferrous, non-ferrous, HDPE, PET and mixed plastics) and the modelling indicates a required capacity of 136,000 tonnes per year sorting potentially 11 streams (film, glass, ferrous, non-ferrous, cardboard cartons, HDPE bottles, PET bottles, HDPE low-grade (PTTs), Low Density Polyethylene (LDPE) and PolyPropylene (PP) collected as PTTs and mixed plastics).

The existing MRF is located in a space constrained building making it difficult to modify and extend the equipment in its current location. Therefore, to accommodate the additional equipment, building extensions are required for an enlarged material reception hall, polymer collection, and baled material outputs.

Improvements and potential modifications to the Longley Lane MRF include:

- Improve space in the MRF by:
    - Relocating the waste bunkers to the adjacent garden waste building. This will require a long transfer conveyor from the MRF building to the garden waste building and development of bulking capacity elsewhere on site for green waste;
    - Relocating the glass processing equipment to the adjacent garden waste building. This will require a long transfer conveyor from the MRF building to

the garden waste building which will have significant issues for access and maintenance due to the necessary height of the conveyor; and

    - Move the Aluminium baler to the garden waste building.

- Add film removal equipment at the front end of the process;
- Re-order the NIR equipment in order to:
    - Remove the HDPE bottles first;
    - Recalibrate (possibly requiring a new unit) the second NIR to target only clear PET bottles;
    - Consider a third NIR unit to target PTT-PET; and
    - Consider a fourth NIR unit to target PTT-PP.
- The residual stream will be the mixed plastics stream.

Capital costs for the above modifications are likely to be in the order of £4m – £8m. There will be an increase in operational costs due to the additional separation equipment and conveyor systems required. The works are forecast to take 24-36 months including planning/permitting process, building modification/extension, removal of current MRF equipment and installation of new MRF equipment.

Taking this facility out of service for c.24 months will result in significant disruption to district collections and would require the use of third party facilities to process the materials. Gate fees at third party sites and haulage vary according to commercial arrangements, however £50 - £60 per tonne is not untypical with the contractor retaining a proportion of income. This option therefore will come with a significant cost for haulage and off site treatment of 100ktpa, estimated at c.£5m pa for the construction period. Manchester, Stockport and Trafford would also require an alternative delivery point to tip materials while the site is redeveloped which would incur tipping away payments from GMCA and cause disruption at the alternate delivery point through increased traffic and waste volumes.

3.2 Option 2 - Refurbish Bredbury IVC building and install MRF processing equipment

Under this option, the redundant In-Vessel Composting (IVC) building at Bredbury would be repurposed through installation of new MRF processing equipment with a throughput of around 136,000 tonnes per year to replace the existing Longley Lane MRF. Half of

the IVC building at Bredbury is currently used for bulking of mixed garden and food waste (biowaste) delivered by Stockport primarily with lower tonnages delivered by Tameside and Manchester. Should a MRF be installed in this building an alternative delivery point would be required for biowaste.

The new MRF would have glass breaking/sorting, metals sorting/baling, and 4 to 5 NIR sorting lines for plastic polymer selection. The capital cost for the process element of this new MRF is estimated at £15m–£18m; and site development and refurbishment of the existing building is estimated at £1m-£2m. Development time is forecast to be 12 months for planning and permitting of the new facility and 24 months construction. This option also avoids the cost (c.£8m-£10m) of constructing a shed to house the MRF as all proposed materials reception, processing and storage activities can be contained in the existing structure. This is subject to structural surveys to confirm the integrity of the steel work given the former use of the building as a composting facility.

This option would not result in any disruption to districts commingled collections as the Longley Lane facility remains operational while the development at Bredbury takes place. However, an alternate delivery point for biowaste would be required. There is not sufficient space at Bredbury to develop another facility for this waste stream meaning that either an existing third party site would be required or a site acquisition would be required followed by development which will add significantly to costs/timescales and would require district collection rounds to be reconfigured to deliver to the alternate location which may bring additional resource/cost implications.

3.3 Option 3 - Refurbish Salford Road IVC building and install MRF processing equipment

Under this option, the IVC building at Salford Road, Overhulton would be refurbished with new MRF processing equipment with a throughput of around 136,000 tonnes per year to replace the existing Longley Lane MRF. The IVC building is currently used for bulking biowaste waste in one half and houses a mattress recycling facility in the other half. These operations would need to be relocated if the building were to be used for a new MRF. The biowaste could be accommodated (subject to Environment Agency approval) in a transfer loading station (TLS) on site with no disruption to district deliveries. The mattress recycling operation could be relocated to either the Bredbury IVC or to the GMCA facility at Arkwright St, Oldham. Both sites have space to accommodate this activity and relocation would not impact on district collections.

The capital cost for the process element of this new MRF is estimated at £15 – 18m and site development and building refurbishment costs are estimated at £2 - 3m. This figure includes an allowance for creation of additional carparking capacity and a new amenity building to house the increased staff numbers at this site. This development would require 12 months for planning and permitting and c.24 months construction. The selection of this site is subject to structural surveys to confirm the integrity of the steel work given the former use of the building as a composting facility.

The significant advantages of this option are the ability to develop the new MRF without disrupting district collections and relocating current activities carried out in the building by repurposing other GMCA assets at alternate locations. This option also avoids the cost (c.£8m-£10m) of constructing a shed to house the MRF as all proposed materials reception, processing and storage activities can be contained in the existing structure.

Another significant advantage of this location is the adjacent GMCA owned ground mounted 2.2MW solar farm that is currently generating electricity for export to the National Grid. The connections are available on site to switch the power generated by the solar array to a direct wire feed for the operation of the MRF. This will make a contribution towards decarbonisation of the GMCA waste estate.

3.4 Option 4 - Develop Nash Road with a purpose built new MRF

Under this option, a new MRF of around 136,000 tonnes per year would be built at the Nash Road, Trafford site on a spare parcel of land in GMCA ownership and would replace the existing Longley Lane MRF. The cost of this new MRF is estimated at £30m based on reported capital costs for recent MRF developments of similar size and processing capacity. The development timetable is forecast to be 12 months for planning and permitting of the new facility and 24 months construction.

The significant advantages of this option are the ability to develop the new MRF without disrupting district collections and continuing to use the Longley Lane facility while construction progresses. This is, however, offset by the increased capital cost required for development of a building to house the processing equipment.

3.5 Preferred Option

The current Longley Lane MRF does not have the capacity or equipment to process the additional tonnage required following the introduction of PTTs, plastic film and liquid cartons. Although the MRF and building can potentially be modified to accommodate a new MRF with the required capability, it will cause significant operational disruption for

an extended period and incur significant additional haulage and treatment costs. Development of a MRF at an alternative facility would avoid these issues.

Based on the options appraisal it is recommended a phased approach is taken. Under phase 1 the replacement MRF is developed at Salford Road, Overhulton in the existing IVC building (subject to structural surveys confirming the suitability of the building structure). The Longley Lane MRF will continue to operate during construction minimising operational impacts. District biowaste currently bulked in the IVC facility will need to be relocated to the TLS on site and the current mattress recycling operations will need to be relocated to alternative GMCA locations. Once the new plant is constructed and commissioned, the existing processing plant at the Longley Lane MRF will then be decommissioned and removed creating an operational space for alternative uses.

Once the new MRF is operational and there is a clearer position in relation to reprocessing capacity in the market and whether additional capacity has been developed in response to the RaWS an assessment can be made as to whether to develop a washing and flaking plant in the vacant Longley Lane MRF building in order to produce plastic flake that can be sold directly to reprocessors. This development would be subject to a future decision and development as phase 2 of the GMCA approach to plastic recycling.

4. MRF Design

The modelling work has been undertaken based on a set of assumptions in order to forecast the potential mix and quantity of materials to be collected in the commingled waste stream. These assumptions have been informed by experience in other countries of DRS schemes, however no one can accurately predict what the impact of the RaWS policy changes will be on our commingled materials. Fundamental questions remain on exactly how the composition of plastic polymers collected will change, what the tonnage of PTTs collected will be and how the DRS will impact the quantities of non-ferrous beverage cans and PET bottles that are presented at the kerbside.

Accommodating flexibility into the design of the MRF through inclusion of additional equipment will therefore be essential to avoid building a facility which then needs modification at a later date. The key ways in which flexibility will be built into the design will be through the inclusion of additional NIR separators over and above the base design

requirements and the use of robotics with artificial intelligence that can be “retrained” to pick additional materials including liquid cartons.

There are 2 options for soft plastics and films:

- They can be collected in a survival bag in the commingled wheeled bin and manually separated via a picking station in the MRF; or
- Separated mechanically via air classification equipment in the MRF.

Suez is currently engaged in a number of collection trials for these materials and the outputs will inform the approach to collection and sorting in GM and will be built into the design of the MRF. Incorporating separation equipment for soft plastics and films into the design now will enable GMCA to access these materials at the forefront of developments in chemical recycling that split low grade plastics back to the constituent hydrocarbons that can be used to produce a range of products from plastic packaging, waxes and liquid fuels. There are several companies in the North West actively developing facilities to process these materials through chemical recycling who will need feedstock materials for these facilities. Incorporation of film separation in the MRF ahead of the 2027 mandatory collection date will therefore put GMCA in a better position to access these markets.

Another aspect that will need to be incorporated into the design is the ability to drain any liquid out of the incoming commingled materials to avoid excess moisture being carried through the plant that will then affect the efficacy of the separation equipment. The wet climate in GM is a contributory factor in this and will need addressing as part of the MRF design.

5. Development Timeline

On the basis that a decision to progress with the development of a MRF at the Salford Rd site is approved, then the following programme will be followed:

- January 24 to December 24 – structural surveys, detailed design, planning application, variation of environmental permit, procurement and appointment of technology provider and construction contractor; and
- January 25 to December 26 – relocation of food and garden waste bulking activity, relocation of mattress recycling activity, IVC building modification, installation and commissioning of MRF equipment; and
- January 27 – commence operation of facility and decommissioning of Longley Lane MRF.

6. Financial Considerations

As stated previously capital costs are estimated to be in the range of £15m to £20m for this facility. The final costs will be subject to detailed inspection of the IVC building, remedial works specification and procurement for a technology provider and construction contractor.

Capital costs of c.£20m will result in a revenue cost of c.£1m plus interest per annum for the anticipated 20 year life span of the facility. Payments would start to flow in the 2025/26 financial year once construction activity commences.

Operating costs for the facility will need to be reviewed and developed once the detailed design stage has been completed. Given the additional separation equipment there will be some increase in utilities consumption (however this will be offset through provision of electricity from the solar array), maintenance and life cycle replacements.

7. Recommendations

To approve the outcome of the options appraisal and the future investment in recyclate sorting infrastructure.