

# TRAMORE VALLEY PARK – VISION TO DELIVERY: THE REHABILITATION OF AN OLD LANDFILL SITE

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**SUMMARY:** Rehabilitation of old landfill sites is now common practice in many countries throughout the world. The process has moved from simply covering the site with soil and establishment of a grass sward towards the emplacement of low permeability capping systems and installation of environmental control technologies for leachate and landfill gas. The prevention of pollution and site cleanup are the primary drivers of such activities, typically underpinned by national legislation. Many municipal governments are now realizing the potential of such sites as areas of green infrastructure and high amenity value, particularly in towns and cities where the suburbs have expanded out to once peripheral dump sites. Tramore Valley Park is an example of one such site. Located at the old Kinsale Road Landfill Site, 3km south of Cork city, the facility has undergone a transformation with in excess of €42m spent on environmental remediation. The master plan aims to transform the former Kinsale Road Landfill into a city asset embracing green technology, renewable energy and practical sustainability and creating a range of family-based activities, events and visitor attractions. Under the guidance of the master plan, phase one of a four phase park development plan is complete (September 2015), resulting in the creation of a formal planting area with park trails and cycle paths, construction of an international standard BMX track as well as reinforced grass playing pitches and events area. Due to open in spring 2016, the park shall undergo further development with final completion and delivery of a regional multiuse amenity area due by 2018.

## 1. INTRODUCTION

Many former landfills, abandoned dumps, mines, and other contaminated sites throughout the world are being reclaimed for a variety of productive uses. These sites once thought to be of limited or no value, are being enhanced through ecological restoration and revegetation schemes (US EPA, 2006).

The prevention of pollution and site cleanup are the primary drivers of such activities, typically underpinned by national legislation. However, there has been a change in mindset of many of the owners of these old contaminated sites (typically municipal authorities) whereby the potential of such sites is being realised as areas of green infrastructure and high amenity value, particularly in towns and cities where the suburbs have expanded out to once peripheral dump sites.

Tramore Valley Park is an example of one such site. Located at the old Kinsale Road Landfill Site, 3km south of Cork city, Ireland, the facility has undergone a transformation with in excess of €42m spent on environmental remediation and ecological restoration.

Under the guidance of a master plan, it is recognized that the facility offers a wide re-use potential that can deliver social, environmental and economic benefits both locally and regionally.

This paper describes the master plan process and details the vision, essential elements and themes as well as the phased delivery of the plan. Project costings and issues relating to park management are also discussed.

## **2. KINSALE ROAD LANDFILL SITE DESCRIPTION**

The Kinsale Road Landfill Site is located on the southern suburbs of Cork, Ireland and operated from 1963 to 2009. Wastes deposited at the facility included municipal solid waste, commercial waste and non-hazardous industrial waste, including non-hazardous industrial sludges. It is estimated that 2.78 million tonnes were deposited at the site. The main area onsite where landfilling was concentrated is ~25ha (landfill dome area).

The site was not designed as an engineered containment landfill but the geology of the location acts as an effective natural barrier to vertical migration of potential contaminants i.e. a thick sequence of peats and underlying silts and clays. Leachate movement is controlled via a leachate collection trench and a series of sump pumps and landfill gas is actively extracted and flared from a network of over 180 gas collection wells. A geomembrane liner (LLDPE) has been installed over the entire area of the waste footprint. This is overlain by a geocomposite drainage layer (Pozidrain) and one metre of soil cover (completed August 2015).

## **3. TRAMORE VALLEY PARK MASTERPLAN**

### **3.1 The Brief**

Cork City Council envisages the development of a public park on the site. The principal objectives are to provide an amenity for the City with a range of attractions and facilities for the visitor and tourist market.

The Brief outlined a number of Core and Optional elements for consideration in the Park.

The objectives of a review completed in response to the brief were to:

- Review and assess Cork City Council's recommendations for end uses of the site,
- Suggest potential uses that might be appropriate for the site,
- Assess the likely target market for the site's ultimate use,
- Review the engineering and technical constraints and future use implications arising from the capping and landfill infrastructure,
- Undertake an economic appraisal of the proposed core and optional park elements, and
- Provide a design vision and park concept plan.

### **3.2 The Vision**

The Vision for Tramore Valley Park is the creation a regional amenity area of national significance that provides a range of family-based leisure activities, events, retail elements and visitor attractions. The master plan aims to transform the former Kinsale Road Landfill into a city asset embracing green technology, renewable energy and practical sustainability and creating a range of family-based activities, events and visitor attractions within a structured landscape setting. By

incorporating practical sustainability within a creative design framework Tramore Valley Park sets a precedent in Ireland for the successful restoration of landfill projects.

Its location at the Southern Gateway of Cork city, together with its accessibility and high degree of visibility, make it ideal as an attraction for the local community, wider hinterland and southwest region. The park will appeal to an expanding city region population, providing new experiences for local families and visitors/tourists.

It is considered that the project can be developed over a 5 to 10 year period and provides for the involvement of an experienced private or third-sector recreation operator.

The primary goals set out in the vision are as follows:

- To create a destination for people from Cork City, County and Region,
- Develop a visitor and potential tourist attraction,
- Develop a high quality landscape structure with a focus on the themes of education, business development and research in the areas of energy, environment and practical sustainability (Figure 1),
- To create a site for multi-generational year round events and activities,
- To enhance renewable energy produced at the site from a variety of sources, geothermal, solar and wind, and
- Design a flexible layout to accommodate future uses in a phased development.

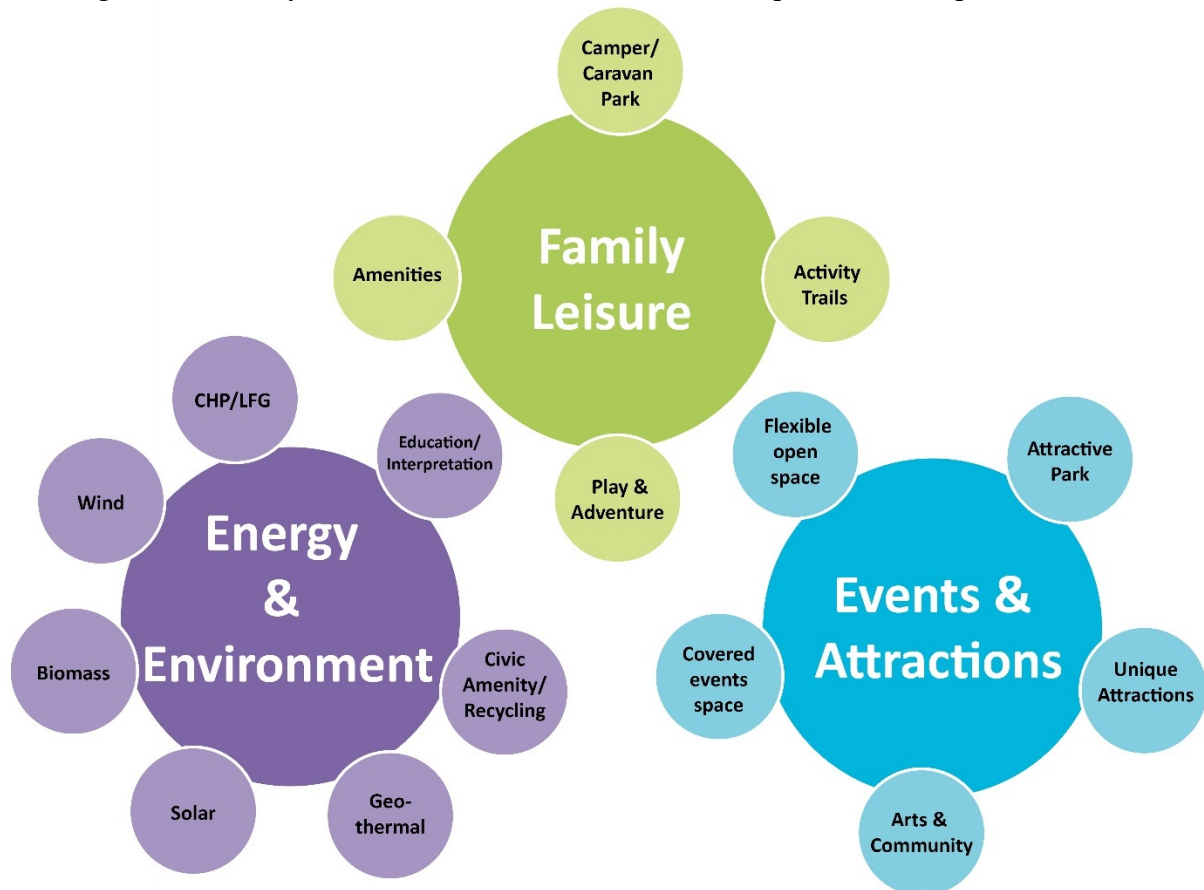


Figure 1. Master Plan Themes

### 3.3 Elements of the Masterplan

The masterplan details a variety of open spaces available at the facility that offer a diverse range of experiences and character areas. The existing network of paths and trails has been further enhanced for walking, jogging and cycling. Areas for active recreation and play are provided for

along with supporting facilities such as parking and toilets. Facilities for food/beverage/retail outlets to support events and activities will be allowed for which will add to the visitor experience and generate income for reinvestment in the park.

The activities proposed for the site will accommodate both active and passive uses and focus on recreational themes for which there is a growing demand and interest and/or currently not on offer within the Cork region.

The plan seeks to maximise and enhance many of the existing natural and semi-natural features at the site such as:

- An extensive forested riparian habitat along the southern boundary,
- Pristine wetland and fen bogland in the north-eastern section of the site, and
- Constructed wetlands and associated containment pond for stormwater management in the south-eastern section of the site.

The masterplan organises the site into various zones with varying activities and intensity of use, guided by the physical attributes of the site (Figure 2), as outlined below:

### **Zone A - Entrance Area**

- Upgraded entrance off the N27 with improved landscaping, onsite parking, amenities, orientation and structures (including management centre).
- Pedestrian access to Black Ash Park and Ride facility for use during large events.

### **Zone B (i) Multi-use Events Area**

- A large, multi-use events area capable of holding a range of activities and events such as a circus, fun fairs, food market, sport events, equestrian eventing etc.

### **Zone B (ii) Motor Home and Caravan Park**

- Specifically to attract, accommodate and prolong the stay of tourists to the City.

### **Zone B (iii) Play and Leisure Area**

- A range of outdoor activities including play, adventure sports (including international standard BMX race track) and activities not currently on offer in the Cork region in addition to family and leisure pursuits such as adventure playground, assault course, climbing wall, viewing tower, zip wires, 3D maze.

### **Zones C & D - Wildlife, Education and Biodiversity areas along bounding Rivers**

- Introduce trails, open up views of river habitat and improve access to river edge.
- Integrate with pedestrian/cycle track linked to South Douglas Road area and connect with the adjoining Frankfield/Grange lands and Vernon Mount House via green bridge over N25 motorway.
- Outdoor classroom constructed with recycled/reclaimed materials.

### **Zone E - Capped Landfill Dome**

- Develop trails and viewing areas.
- Incorporate art, landscape, adventure and energy features.
- Installation of landmark feature at the highest point.

### **Zones G, F and H - Lands to the South of the N25 Motorway**

- Improve access, connectivity and permeability to lands with potential pedestrian/cyclist green bridge crossing of the N25 motorway (an example of a green bridge over a motorway in Vancouver is shown in Figure 3).
- Develop trails and viewing areas.
- Incorporate landscape, play and art features.



Figure 2. Aerial Perspective of Tramore Valley Park (Zones A – H inset)

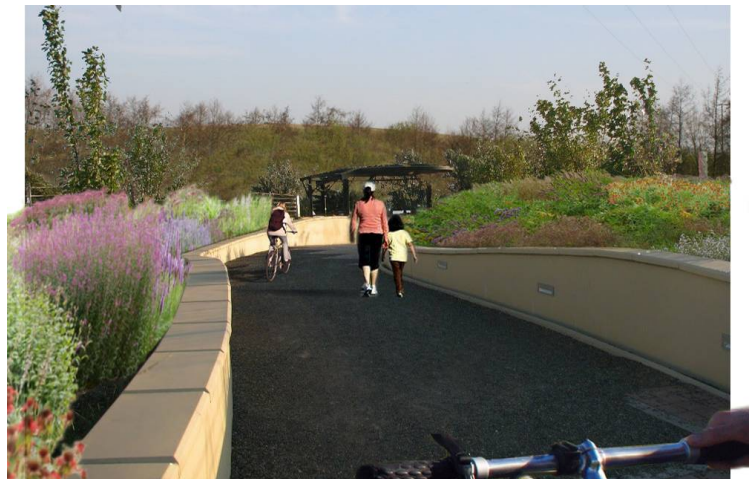


Figure 3. Green Landbridge over a motorway in Photo of Vancouver Land Bridge, Washington State, USA. Source: Bruce Forster. Bridge design by Jones & Jones Architecture

## **4. DELIVERY**

### **4.1 Phased Strategy**

Delivery of the project over a 5-10 year period is envisaged and a series of strategic actions are outlined for steps towards completion including a phasing strategy (Phases 1 – 4), management and costing plan.

Enabling works associated with the closure, restoration and aftercare management plan (CRAMP) as set out in the waste license were completed in August 2015. This entailed emplacement of the final portion of the LLDPE liner over the area of the waste footprint (Figure 4) and installation of environmental control technologies for leachate and landfill gas.

These works also included the construction of new site roads, site infrastructure and a car park (200 spaces).

Piling for foundations for a future multiuse/iconic building with an estimated footprint of 10,000m<sup>2</sup> and for six small wind turbines was carried out during the capping phase. Despite the fact that the City Council does not have the funds to build or install these elements, the foundation piling has ensured future proofing of the site and will enable construction when funding becomes available.

Other ground works completed to facilitate park development included:

- outdoor multi-use area and parking,
- multi-use events area including reinforced grass (1.5 ha),
- grass seeding of all designated areas (including 25 ha on capped dome), and
- shaping of mounds for BMX track.



Figure 4. Installation of the LLDPE Liner, October 2014

### **Phase 1 Park Development – 2015**

Phase 1 park development was largely complete at the time of writing (September 2015) – see Figures 5 and 6. These works involved:

- Base landscaping including structural planting within site and biomass/meadows on landfill mound,
- Completion of trails, boardwalks, signage, site furniture (Figure 5),
- Design and construction of BMX track (construction of the BMX track is shown Figure 6),
- Construction of sports pavilion building with toilets/showers to facilitate field sport activities,
- Completion of cycle/pedestrian track linking Douglas village to the park including new river crossing using reclaimed site weighbridge (Figure 7),
- Completion of multi-use events area (Figure 8),
- Development of ideas for iconic feature on capped dome, and
- Site investigations and design of a green-bridge over N25 motorway linking the park to Vernon Mount historic house and Frankfield/Grange residential areas to the south.



Figure 5. Upgraded Woodland Walk at Tramore Valley Park



Figure 6. BMX track under construction (April 2015)



Figure 7. Reuse of the old weighbridge linking the park to the eastern river walkway



Figure 8. Multi-use events area at Tramore Valley Park, September 2015

### **Phase 2 Park Development – 2016 - 2017**

- Formal opening of park to the public in January 2016.
- Begin to establish a programme of events for the multi-use area.
- Continue to host a range of events & activities on site (orienteering, cross country and track running).
- Completion of construction of adventure/play area.
- Development of adventure activities on capped dome.
- Consider development of pedestrian link to Park and Ride Facility.
- Consider development of Motor Home Caravan Park and relocation of pitch and putt course.
- Boundary treatment and railing realignment along South City Link Road (N27).
- Commission design of Multi-Use/Iconic Building.
- Consider initial development of PV Solar Farm (2ha).
- Redesign of main site entrance to reflect the themes of leisure, adventure and sustainability to provide an attractive main entry point to the park.
- Undertake traffic feasibility study on providing a right hand turning lane into the site from the N27 dual carriageway.

### **Phase 3 Park Development – 2017-2018**

- Commence construction of Multi-Use/Iconic Building.
- Commence development of upgraded site entrance with associated marker feature.
- Establish additional links from adjoining residential areas to the east via pedestrian bridges/gates.

## **Phase 4 Park Development - 2018**

- Completion of built development.
- Completion of Multi-Use/Iconic Building with indoor leisure/adventure area.
- Commence construction of the green bridge over N25 motorway.

## **4.2 Park Management**

The site will remain the responsibility of Cork City Council and shall continue to operate under the conditions of the waste licence granted by the Environmental Protection Agency. However, some of the commercial aspects (e.g. motor home park, retail, indoor adventure, BMX track etc.) may be managed by an experienced private or third sector Leisure and Recreational Operator.

There are broadly five ways that the operation of the Park could be delivered. These are:

- Directly by a Division or Department within Cork City Council,
- Outsourcing to a consumer facing business,
- An Independent Trust or Foundation,
- Select an Operating Partner, and
- Use of a Special Purpose Vehicle (SPV).

Each option has its pros and cons and presently there is no obvious preferred solution. Each will be considered carefully and some soft market testing will be required to explore their viability.

For year one it is likely that the green elements (grass areas and trails) will be managed using internal City Council resources with a third sector Leisure Operator taking responsibility for special events (circuses, track running, BMX etc.).



Figure 8. Overall master plan

## **4.3 Costings**

To date approximately €42million has been spent on restoring and rehabilitating the landfill site.

The majority of the funds (€40m) have been spent on pollution control technologies and engineering structures to bring the old landfill site to the required standard under the waste licensing regulations.

Just over €2m of the capital fund was allocated for phase one park delivery. It is estimated that approximately €15m will be required over the coming years to complete the remaining phases of Tramore Valley Park. In the interim period, Cork City Council shall continue to develop the park incrementally using its own reserves and shall seek additional funds/grants from central government and semi-state organizations for special projects set out in the masterplan.

## **5. CONCLUSIONS**

The key to the success and progress of the masterplan to date has been the involvement of stakeholders from the local community, project developers, consultancies (engineering, environmental and landscape architects) and other public sector agencies in the early phases of decision making and plan development.

Operation of the park in line with the requirements of the waste license shall form an essential element of the plan. Managers will have to ensure that pollution control technologies are maintained and remain 'fit for purpose' and that the landfill element of the park is managed in a fully sustainable way. In the absence of a well programmed set of measures for aftercare, many of the technical issues identified will not be realised and investment in aftercare facilities will deteriorate over time resulting in loss of control over environmental risks ([www.sufalnet4.eu](http://www.sufalnet4.eu)).

Going forward, Cork City Council shall seek to promote responsible and innovative strategies for environmental sustainability and ecological restoration through demonstration, instruction, and collaborative investigation at Tramore Valley Park.

It is hoped that the facility will be used as a platform for generating knowledge applicable to a broad range of urban environmental issues including habitat restoration, novel methods of wastewater treatment, alternative energy generation and help foster informed attitudes towards responsible park usage.

## **ACKNOWLEDGEMENTS**

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## **REFERENCES**

Master Plan for Tramore Valley Park, Cork, May 2012. Prepared by Brady Shipman Martin on behalf of Cork City Council.

<http://www.corkcity.ie/services/environmentrecreation/tramorevalleyparkmasterplan/>

US EPA (United States Environmental Protection Agency), 2006. Revegetating Landfills and Waste Containment Areas: Fact Sheet. EPA 542-F-06-001 (October 2006). Office of Superfund Remediation and Technology Innovation, Arlington, Virginia.

[www.sufalnet4.eu](http://www.sufalnet4.eu) The SufalNet Project. Landfill Examination, Aftercare and Redevelopment: An Integrated Approach