

Norfolk Resilience Action Plan

“Start where you are, use what you have, do what you can”

—Arthur Ashe

Norfolk is a city shaped by water. Its bridges, streets, and neighbourhoods are woven around rivers, creeks, and the bay. Our city and its green spaces are increasingly affected by environmental concerns such as flooding, extreme heat, pollution, habitat loss and food insecurity. Addressing these resilience challenges requires more—and less—than large infrastructure projects. We can look around our city and ask how it can work more efficiently for our neighbours and environment then take small but consistent steps forward.

Purpose

Develop a practical, measurable, and scalable model for turning **Norfolk’s waste streams, underutilized public spaces, and community participation into assets for local resilience.**

The pilot connects two immediate opportunities:

1. **Recover and research local materials** that could potentially be returned to the community as useful, tested green infrastructure.
 2. **Plant and restore underutilized public spaces** with food-producing plants, pollinator habitat, and vegetation selected for Norfolk’s flooding, heat, erosion, and biodiversity challenges.
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Contents

Track 1 — Plastics Recovery & Reuse

- Start Small: PET #1
- Four Pilot Locations
- Moveable Ocean-Themed Deposit Stations
- Data-Driven Expansion
- Expand Only After Proving the First Stream
- Circular Materials Research
- Future Glass Recovery & Aggregate Track

Track 2 — Landscape & Resilience

- Start Small: One Tree, Shrub, or Seed Sowing
- Site-Specific Planting
- Food-Producing Landscapes
- Pollinator & Habitat Support
- Flood, Heat & Erosion Applications
- Community Stewardship
- Scalable Landscape Growth Model

Convergence — The Circular Resilience Demonstration

- Recovered Materials + Resilient Landscapes
- Demonstration Sites
- Circular Rain Gardens
- Measurement & Expansion

The Circular Resilience Loop

- Recovery
 - Research
 - Testing
 - Landscape Application
 - Stewardship
 - Measurement
 - Reinvestment & Expansion
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TRACK 1 — PLASTICS RECOVERY & REUSE

Start Small: PET #1

Establish four dedicated plastic-recovery stations representing different Norfolk environments and community groups.

Four Pilot Locations

1. **KNB / Norfolk Zoo** — visitors + environmental education
2. **Elizabeth River Trail / Chelsea** — trail users + neighborhood
3. **Blair / Colley-Ghent** — school + residents + restaurants and bars
4. **Lambert's Point / ODU** — university + neighborhood

The first phase would collect **PET #1 water bottles only**.

Starting with one clearly defined material creates a cleaner, more measurable feedstock and allows the City to establish collection, transportation, sorting, processing, participation, and contamination data before expanding the program.

The objective is not to collect every type of plastic immediately. It is to determine whether Norfolk can successfully establish a reliable local recovery system beginning with one material stream.

Moveable Ocean-Themed Deposit Stations

Partner with local makerspaces and artists to design attractive, durable collection containers shaped as ocean creatures, connecting plastic recovery to Norfolk's identity as a coastal and maritime city.

Use removable/swappable collection containers so full containers can be exchanged and transported for processing without requiring permanent infrastructure at every site.

This approach allows the City to **move, test, and relocate stations based on actual participation and collection data**.

Build a Data-Driven Expansion System

Track:

- Volume collected
- Material purity and contamination
- Collection frequency
- Participation
- Operating costs
- Site demand
- Processing requirements

Each station would include a QR code allowing residents, businesses, schools, and organizations to request a future station.

Requests, participation, collection data, and site performance would help determine where additional stations should be installed.

This creates a feedback system in which **community demand and measurable performance help determine expansion.**

Expand Only After Proving the First Stream

Once PET collection consistently reaches and maintains an agreed-upon volume and purity threshold, the City could investigate additional material streams:

1. **PET #1** — water and soda bottles
2. **HDPE #2** — milk jugs, detergent and shampoo bottles
3. **LDPE #4** — plastic bags, produce bags, and film
4. **PP #5** — specifically approved, clean polypropylene items such as bottle caps

Food containers would not be a priority because food residue and contamination can make the material more difficult to collect and process.

Expansion should occur only when the City has sufficient data to understand the **cost, contamination, logistics, processing requirements, and potential end uses** of each additional material.

CIRCULAR MATERIALS RESEARCH

A longer-term objective is to determine whether recovered materials can become useful Norfolk landscape infrastructure.

Plastic → Landscape Materials

Partner with local:

- Makers
- Engineers
- Universities
- Material researchers
- Recycling organizations

to investigate whether recovered plastics can be transformed into:

- Landscape blocks or bricks
- Pavers
- Planting-bed edging
- Rain-garden components
- Bioswale components
- Erosion-control elements
- Other non-structural landscape infrastructure

The initial objective would **not** be structural construction.

Any proposed material would need appropriate testing for strength, durability, weathering, environmental performance, accessibility, and safety before being used in public infrastructure.

Lightweight Materials

Because recycled-plastic products may be substantially lighter than some conventional landscape materials, researchers could also evaluate whether lightweight components offer advantages for certain applications on Norfolk's low-lying, flood-prone, or potentially compressible soils.

FUTURE GLASS RECOVERY & AGGREGATE TRACK

After establishing the initial recovery system, evaluate glass as a separate future material stream.

Clean recovered glass could potentially be processed into appropriately graded recycled glass aggregate for investigation in:

- Drainage systems
- Rain gardens
- Bioswales
- Planting-bed drainage
- Permeable landscape applications
- Erosion-control applications
- Sidewalk and pedestrian infrastructure
- Potentially coastal or shoreline resilience applications

The objective would be to determine whether processed glass aggregate can safely and economically replace virgin aggregate in appropriate Norfolk applications.

International Precedents

The use of recycled glass as an engineered aggregate is already being investigated and implemented internationally.

Examples include:

- **Australia:** recycled crushed glass has been incorporated into infrastructure applications including drainage, pipe bedding, landscaping, paving-related applications, and other civil works.
- **United States:** the Federal Highway Administration has documented the use of crushed waste glass in asphalt, road base, fill, and other infrastructure applications.

These examples do not mean that the same applications should automatically be adopted in Norfolk. They demonstrate that processed waste glass can become an engineered material rather than simply a discarded waste stream.

Norfolk could investigate which applications are appropriate for its own climate, soils, stormwater systems, engineering standards, and environmental requirements.

TRACK 2 — LANDSCAPE & RESILIENCE

Start Small: One Planting

Identify underutilized, vulnerable, or highly visible spaces where **even a single planting can become the starting point for a larger resilience intervention.**

The model is intentionally scalable:

One seed or tree → observe → measure → add → connect → expand

A project does not need to begin with a large installation. Depending on the site, the first intervention could simply be:

- Planting a single resilient fruit or shade tree
- Planting a small group of shrubs
- Sowing native or pollinator-supporting seeds
- Replacing a small area of turf with appropriate vegetation
- Establishing a small edible or habitat planting

Each planting becomes a **demonstration point and potential building block for future expansion.**

The objective is to turn small acts of planting into cumulative improvements in:

- Flood and stormwater management
 - Heat reduction
 - Erosion control
 - Pollinator and wildlife habitat
 - Food access
 - Urban biodiversity
 - Beautification
 - Community stewardship
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Grow According to the Site

As a planting becomes established, additional elements can be added based on observed conditions, performance, and community capacity.

For example:

Tree → Planting Cluster → Garden → Stormwater Landscape → Habitat Corridor

A single tree could eventually be surrounded by fruiting shrubs, pollinator plants, groundcovers, living mulch, and or other vegetation.

If the site experiences runoff, a future phase could incorporate a rain garden, bioswale, berm, or other stormwater feature.

Likewise, multiple successful individual plantings can eventually be connected to create **neighborhood-scale food, habitat, and resilience corridors**.

The objective is not to install everything at once. It is to create landscapes that can **grow incrementally as resources, knowledge, and community participation increase**.

SITE-SPECIFIC PLANTING

Plant selection would remain based on the conditions of each location, including:

- Soil
- Sunlight
- Drainage
- Available space
- Heat exposure
- Flooding
- Erosion
- Maintenance requirements
- Long-term survivability

Potential plantings could include:

Wetter or Flood-Prone Areas

- Persimmons
- Swamp highbush blueberries
- Other species appropriate for wet or seasonally saturated conditions

Heat-Prone Areas

- Figs
- Heat- and drought-tolerant pollinator plants
- Appropriate Mediterranean-adapted species where conditions allow

Food & Habitat Corridors

- Pawpaws
- Persimmons
- Blackberries
- Raspberries
- Blueberries
- Figs
- Other appropriate fruiting and habitat-supporting plants

Plant selection should remain flexible and evidence-based. Species should be selected for **the conditions of the specific site**, rather than assuming that every plant is appropriate everywhere.

A SCALABLE LANDSCAPE GROWTH MODEL

The landscape track can expand incrementally:

Level 1 — Seed or Tree

One planting establishes the starting point.

Level 2 — Cluster

Additional plants are added based on site performance and available resources.

Level 3 — Demonstration Landscape

The site develops into a small edible, ecological, habitat, or stormwater landscape.

Level 4 — Neighborhood Network

Multiple successful sites are connected through streets, medians, parks, vacant spaces, schools, businesses, and community properties.

Level 5 — Citywide System

Successful models are replicated across Norfolk using documented planting methods, species recommendations, maintenance practices, and performance data.

This allows Norfolk to start with what it has:

One seed.One tree.One volunteer.One available space.

Then build from there.

COMMUNITY STEWARDSHIP

The landscape track can also create opportunities for meaningful community participation.

Residents and community organizations could participate in:

- Planting
- Cleanup
- Mulching
- Maintenance
- Harvesting
- Monitoring
- Educational programming

Community participation can also help identify future locations. Residents, businesses, schools, neighborhood organizations, and other partners could request or nominate potential planting sites, creating a pipeline of locations for subsequent implementation.

Where legally and administratively appropriate, the City could also explore whether certain low-level fines or traffic violations could be satisfied through supervised civic service, such as approved cleanup, gardening, planting, or landscape stewardship activities.

This would connect accountability with visible community improvement while creating additional capacity for maintaining public spaces.

CIRCULAR RESILIENCE CONVERGENCE

The two tracks ultimately become most powerful when they meet in the same physical landscape.

Rather than treating recycling and environmental restoration as separate programs, Norfolk could develop **Circular Resilience Demonstration Sites** where recovered materials, landscape restoration, stormwater management, food production, habitat, and community participation are tested together.

Example: A Circular Rain Garden

Recovered PET

→ researched and tested for appropriate non-structural landscape products

Recovered glass

→ cleaned, processed, and tested as drainage aggregate

Recycled-material edging, pavers, or blocks

→ used to define pathways, planting beds, or other appropriate landscape elements

Rainwater

→ directed from surrounding pavement into the rain garden

Resilient plants

→ provide food, habitat, shade, and ecological function

Community participation

→ planting, cleanup, maintenance, monitoring, and education

One possible design could be a **spiral or terraced rain garden**, using appropriately tested recycled-material elements to create different elevations and planting zones.

The result could combine:

Recovered materials + stormwater management + food production + habitat + public space + education

The project becomes something residents can actually see, walk through, learn from, and participate in.

DEMONSTRATION SITE GROWTH

The convergence model should follow the same incremental approach as the individual tracks.

Phase 1 — Establish

Begin with a small planting or simple landscape intervention.

Phase 2 — Enhance

Add complementary vegetation, habitat features, or stormwater elements as site conditions and resources allow.

Phase 3 — Integrate

Introduce appropriately tested recycled-material components where they provide a functional benefit.

Phase 4 — Demonstrate

Create a visible public demonstration site where materials, landscape performance, and community stewardship can be evaluated together.

Phase 5 — Replicate

Use the results to determine which elements can be safely, economically, and effectively reproduced at other Norfolk locations.

EXAMPLE DEMONSTRATION

A future demonstration site could potentially include:

PET recovery

→ local collection, processing, and research

Recycled PET

→ tested pavers, edging, blocks, or other appropriate non-structural applications

Recovered glass

→ tested drainage aggregate

Circular rain garden

→ captures and infiltrates stormwater

Fruit-producing plants

→ food + shade + community benefit

Pollinator habitat

→ biodiversity + ecological function

Pedestrian path

→ public access + education

Community stewardship

→ planting + cleanup + maintenance + monitoring

MEASUREMENT & EXPANSION

Both tracks should generate information that informs the next phase.

Track 1 Measures

- Material volume
- Material purity
- Contamination
- Participation
- Collection frequency
- Operating costs
- Processing requirements
- Material performance
- Community demand

Track 2 Measures

- Plant survival
- Growth and establishment
- Maintenance requirements
- Stormwater performance where measurable
- Shade and heat conditions where appropriate
- Pollinator and habitat activity
- Food production
- Community participation
- Site expansion

Convergence Measures

Where recovered materials and landscape interventions are combined, the City could additionally evaluate:

- Material durability
- Installation costs
- Maintenance costs
- Environmental performance
- Public use
- Safety and accessibility
- Stormwater function
- Community engagement
- Replicability

The purpose of measurement is not simply to prove that a pilot worked.

It is to determine **what should happen next.**
