

Design Narrative

ReDe BOSTON 2100

Regenerative Design International Exposition

Energy Positive, Transit-Oriented District

Raised Ground Plane

Tidal Basins, Land Wharves, Suspended Footbridges

18 Acres of Public Open Space, 6 Million SF Mixed Use Development

Accessible Waterfront, Vibrant Resilient Community

Car-Free District, Low Carbon Transit

Linking Boston's Downtown & Convention Center

Introduction

Created through public-private investment and attracting visitors from around the world, this vibrant 100-acre district, reclaimed from former industrial sites, advances Boston's clean energy economy and carbon neutrality by creating 18 acres of public open space and 6 million square feet of energy self-sufficient, high performance development for residential, office, hotel, retail and transit uses.

This bold plan builds on Boston's unique history of land works and technological innovation, embracing rising seawater as both an urban amenity and energy resource.

Raised grades, streets and infrastructure elevate the entire district 12 to 15 feet above existing conditions, protecting development from rising tides and storm surges. Newly elevated A Street meets the height of existing Summer Street. Tiered tidal basins, evoking sheltered coves along a rocky coastline, create a resilient wet-dry zone designed for public access.

At every state of tide, the waterfront is accessible for active public uses, including recreation, community gathering, and live performances.

Two splayed waterfront parks, one larger and one smaller, frame waterfront and City views. Two parallel linear parks, a greenway and landscaped haul line, green the entire length of the district.

Water itself is used as both an energy source and thermal storage medium. "Thermal jellyfish" with closed loop "tentacles" seasonally extract and replenish thermal energy from the Fort Point Channel. District thermal energy is also generated by solar-powered electric hot water heaters, rooftop solar thermal panels, and mechanical exhaust heat exchange. Thermal energy is stored in underground, insulated water tanks (hot and cold) which effectively raise the grade and lessen the need for urban fill.

This car-free district is served by expanded transit, on-demand autonomous vehicles, and bike share facilities. Three pedestrian bridges over the Fort Point Channel and three vehicular bridges over the Haul Road forge vital new connections between the Financial District and Convention Center area.

Vision Plan

The ReDe district creates 18 acres of public open space and activates the Fort Point Channel watershed. Interlaced with a connected system of waterfront parks and linear greenways, the district provides daylight, fresh air, and water and park views to nearly every building.

Fort Point Channel itself is transformed from a physical barrier into the heart of an urban celebration. From the west, three suspension footbridges link the Financial District and South Station to the district's tidal basins and waterfront parks. From the east, three vehicular bridges spanning the Haul Road link the Convention Center to the greenway.

Pedestrians can access the ReDe Dock for an orientation to the Regenerative Design International Exposition. A floating performance stage located mid-channel is within view of both shores. "Thermal jellyfish" moored throughout the channel are lit from within, an artistic expression and integral part of the renewable district energy system. Water Fire braziers designed to hold wood logs are adjustable to compensate for the rising water level. Lit by boat, they provide magical reflective bonfires for a Boston Water Fire Arts celebration on summer evenings.

Along the waterfront, a continuous Harborwalk provides public access for exploring stepped tidal basins and strolling along both sides of the Channel. These basins are studded with boulders for a naturalistic effect and ramped to provide universal access and seating. The design incorporates a boat launching ramp, kayak rental facility, and tidal pool "Eco-Exploration Zones."

Upland from the tidal basins, waterfront parks accommodate many varied uses for the residents and visitors to the ReDe District. The parks incorporate event lawns, transit stops for the electric busway system, Hubway stations (bike share), picnic areas, a dog run, and a children's playground. Landscape design of the waterfront parks includes water features and engineered cleansing bioswales designed to use plants to remove pollutants from stormwater run-off. The parks are irrigated using rainwater collected and stored on blue roofs.

The linear greenway provides a front door to innovative ReDe exposition buildings as well as a venue for a public market, food truck court, outdoor dining terrace, café pavilion, and sightseeing tour pavilions. Former Channel Center Street, now one level below the raised grade of the surrounding district, is transformed into a court supporting public events and pop-up markets for crafts and antiques. The historic red brick buildings are entered both at their original first floor levels fronting the court and at their second floor levels fronting the surrounding elevated streets.

Throughout the district, dedicated busways support a system of electric, articulated buses served by five stations with accessible raised platforms. These busways and stations are a loop extension of the Silver Line. Three Hubway stations and dedicated bike lanes with raised curbs, separating bicyclists from vehicular traffic, are also provided.

At the southeast corner, near the convention center expansion, a district energy plant produces renewable energy for the entire district using advanced energy production technologies. Atop the plant, a welcoming visitor center provides a sky café and overlook.

The vision plan projects that by 2100, a new manufacturing headquarters complementing the district will be constructed over the existing Gillette plant, protecting operations from the risk of rising tides. This headquarters will demonstrate climate preparedness and ecological design strategies, powering manufacturing processes with renewable energy and energy recovery. The plant will be a model for a healthy, productive, safe work environment, surrounded by publicly accessible parkland.

International Exposition

ReDe BOSTON 2100, a **Re**generative **De**sign International Exposition, is an energy positive, transit-oriented district that exemplifies climate preparedness. World-class architecture, design and planning attract millions of visitors a year to the district which houses over 2,000 residents and 200 businesses.

Projects of the **ReDe** exposition incorporate ground-breaking sustainable and regenerative technologies. For example, the office buildings variously integrate phase change glass, electrochromic facades, timber construction, modular construction, bio-responsive shading, double-skin facades, and experimental photovoltaic films. The housing buildings include regenerative prototypes and live-work micro-units.

Development of the district reflects exceptional innovation and creativity owing to an implementation strategy that awards development sites to developer-designer teams on the basis of international ideas competitions. Public input is sought in evaluating the competition proposals.

Implementation

The parcel plan delineates fifteen development sites with allowable heights ranging from 10 to 24 stories, and five additional civic structures. Permitting uses include hotel, residential, retail, office and a district energy plant. The mixed-use district is developed in phases, adjusting for developer-designer interest in each parcel.

Initial infrastructure and raised roadway construction reflect investments by public utility companies and property and casualty insurers, State economic development and renewable energy grants, and Federal investment tax credits.

Development plans for each parcel are determined by an international competition soliciting the best architectural, engineering and development ideas as judged by industry experts and public hearings.

Expedited permitting and public review are supported by City, State and Federal governments.

Tax increment financing, linkage payments (entitlement exactions), and betterment assessments are used to construct parks, bridges, docks, waterfront amenities, and other public benefits.

Payments in lieu of property taxes fund operating and maintenance reserves for the public space.

Low Carbon Transit & Resilient Living

Private automobiles, no longer practical nor permitted in 21st century cities, are surpassed in efficiency, convenience and economy by low-carbon transit. On-demand driverless cars, once futuristic, are in common use by residents and visitors alike, as are short-term rental bicycles available throughout the district.

The district is served by dedicated busways that connect the ReDe District with the Innovation District, Convention Center and South Station via the Silver Line loop, and five bus stops with raised platforms that provide safe passenger transfer at subway speeds.

Highly compact, well-appointed micro housing units provide flexible multi-functional space, giving residents control over visual privacy, acoustical insulation, lighting levels, thermal comfort, and energy use. Readily configurable for socialization or solitude, units are especially popular as live-work accommodations as knowledge workers increasingly telecommute in pursuit of a low carbon lifestyle.

The district's residential buildings represent a new direction for urban living in 2100, when a rising majority of the world's 11 billion people live in densely populated cities. These high performance, carbon neutral buildings are designed to harvest daylight, generate solar energy, collect rain water, grow food, naturally ventilate, support community and showcase innovation, aiming to not just utilize but also replenish natural resources.

Renewable District Energy

The district energy plant is networked with others throughout the City, providing emergency back-up and safeguarding against black-outs during storm events, thus promoting resilience. Networked district energy plants can operate autonomously or cooperatively, sharing loads when one or more plants experience excessive demand or suffer damage by a super storm.

Raising the ground plane of the entire district in anticipation of rising tides presents the opportunity to structure half the district over large thermal storage tanks, effectively using the water as "fill." These tanks are aligned with buildings and open spaces, allowing new raised utilities to run under streets.

This energy-wise strategy capitalizes on the natural qualities of the earth as an insulator and water as a thermal transfer medium, and also reduces the need for conventional fill (soils).

These insulated tanks serve as a "thermal bank," storing heat in the summer (diagrammed in red) and cold in the winter (diagrammed in blue), with six months of energy deposits accruing for draw down in the alternate season.

Heat is generated during the summer by a combination of solar thermal panels, solar powered electric hot water heaters, mechanical heat rejection (from air conditioning), and air-source and seawater-source heat exchange. Cold is generated during the winter by mechanical cold rejection (from space heating), and air-source and seawater-source heat exchange.

More tanks are provided for cold than heat storage owing to the comparatively smaller temperature differential of cold water maintained at 35 degrees (to preventing freezing), versus hot water heated to 180 degrees, relative to the human thermal comfort range of 65 to 75 degrees.

Conclusion

Using Boston's traditional strategy of altering its topography for the common good provides a tremendous opportunity to link downtown Boston to the convention center area and to raise Boston's profile as a city of innovation for resilient living in the face of rising tides.

The **ReDe** vision plan imagines a future city that can withstand seawater inundation and increased storm events while creating a vibrant urban experience at development densities that can leverage climate adaptation and low-carbon transit investments.

Further, the **ReDe** vision plan proposes an international exposition of exemplary sustainable buildings and landscape designs that will attract visitors from all over the world, enhancing Boston's distinction as an environmental and educational leader.

Moreover, this proposal provides just as much developed square footage as previously approved master plans while creating nearly 50% more public open space. This is a significant planning benefit. In addition, the vision plan greatly enhances the waterfront, reclaiming former industrial sites and parking lots for public access and making Fort Point Channel both a destination and a gateway.