



收稿时间 / Received Date | 中国分类号 / TU986.2  
2013-05-23 | 文献标识码 / B

## 城市景观基础设施廊道设计： 美国亚特兰大城市环路

### An Urban Landscape Infrastructure Corridor: The Atlanta BeltLine, USA

利奥·阿尔瓦雷斯, 瑞安·格拉维尔, 米卡尔·利普斯科姆, 瓦尔季斯·祖斯马尼斯 / Leo ALVAREZ, Ryan GRAVEL, Mical LIPSCOMB, Valdis ZUSMANIS

翻译 Translated by / 苏博 Bo SU  
校对 Proofread by / 李霞 Xia LI

#### 摘要 .....

美国亚特兰大城市环路是一个长达35km的城市廊道改建项目, 该项目将通过运输线、开放空间和步道连接45个社区。作为对穿越皮德蒙特高原地区的山谷和山脊之间的废弃铁路的再利用, 环路的设计主动契合了其文脉中的地形和文化多样性。该项目是一个将有助于组织、参与和引导美国发展最快的大都市地区未来的发展的综合性的景观基础设施范例。

#### 关键词 .....

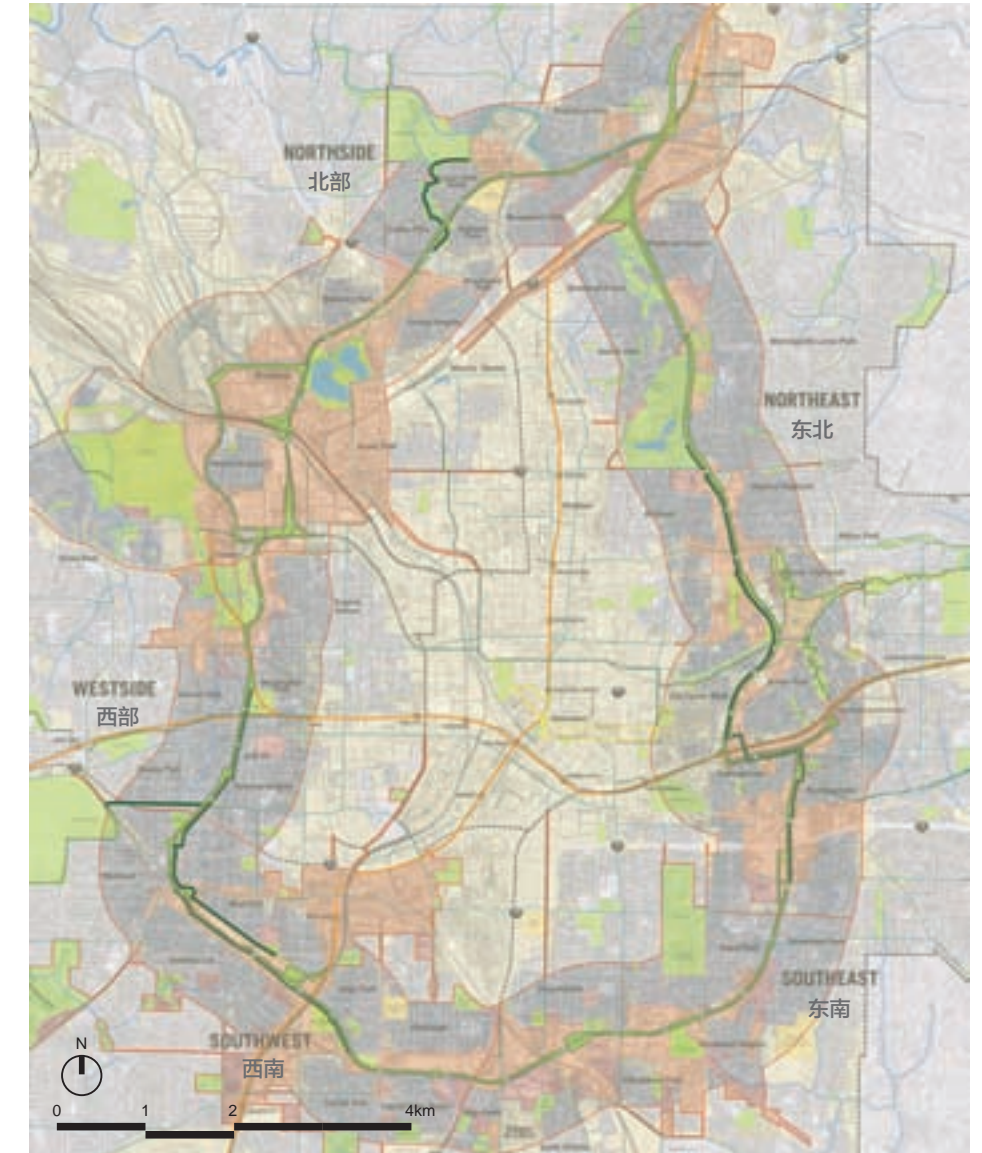
景观基础设施; 绿道; 运输线

#### Abstract ...

The Atlanta BeltLine is a 22-mile (35 km) transformative corridor project that will connect 45 neighborhoods through transit, open space and trails. As a repurposed series of abandoned railroad segments that run across the valleys and ridges of the Piedmont Plateau region, the physical design of the corridor actively responds to both the physiographic and cultural diversity of its context. It is a comprehensive example of landscape infrastructure that will serve to organize, engage and guide future development in one of America's fastest growing metropolitan areas.

#### Key words ...

Landscape Infrastructure; Greenway; Transit



- BeltLine TCU Corridor 城市环路TCU廊道
- Possible BeltLine Transit Stop 潜在城市环路站点
- MARTA Rail System 亚特兰大捷运铁路系统
- Atlanta Streetcar 亚特兰大电车线路
- Tax Allocation District 税收分配区
- BeltLine Study Area 城市环路研究区
- BeltLine Study Group Boundary 城市环路研究范围边界
- Proposed In-street Bike Lanes (Connect Atlanta plan) 规划的街边自行车道 (连接亚特兰大规划)
- Path Trails (Existing + Proposed) 步行道 (现有+规划)
- Built BeltLine Trails (or under construction) 建成 (或在建) 的城市环路步道
- Interim Hiking Trails 临时的远足步道
- Alternate BeltLine Trail Alignment 备用的城市环路步道
- Parks + Greenspaces 公园+绿地
- Waterways 水道

设计时间: 2010年2月至今  
建设时间: 2011年12月至今  
建成时间: 2035年  
所获奖项: 2013亚特兰大城市设计委员会优秀奖

Location: Atlanta, GA, USA  
Area: 22 miles (35 km) of Multi-use Trail and Transit  
Client: Atlanta BeltLine, Inc.  
Landscape Architecture: Perkins + Will  
Cost Item: USD 1,200 million  
Chief Designer: Leo Alvarez, Ryan Gravel  
Project Leader: Valdis Zusmanis, Maxine Coleman  
Project Team: Chad Stacy, John Threadgill, Micah

Lipscomb, Phylis Zhou, Jeff Williams, Cassie Branum, Brent Pierce, Kevin Bacon, Seth Crawford, Basak Alkan, David Green, Matt Malone  
Typology Consultant: James Corner Field Operations  
Design Period: February, 2010 to Present  
Construction Period: December, 2011 to Present  
Completion Time: 2035  
Award: 2013 Atlanta Urban Design Commission Award of Excellence

1. 建成后的城市环路景观 © Perkins + Will
2. 亚特兰大城市环路总平面图 © Perkins + Will
1. Urban BeltLine after construction © Perkins + Will
2. Overall map of Atlanta BeltLine © Perkins + Will

### 1 项目概况

亚特兰大城市环路是一个目标宏大的、持续25年的项目，它旨在将一系列已经废弃的铁路环线改造成佐治亚州亚特兰大市中心区具有组织性的特色工程。这是一个难得的、将景观基础设施作为驱动该地区主要城市中心区再开发的主导力量的范例，其不仅满足了急迫的运输需求，同时也为市民提供了休闲机会和通勤选择。项目的实施主要包括三个方面：依照环路的地形和文化特色制定设计框架；赋予灰色基础设施新的用途，使其成为综合性的城市景观；以及提升社区参与和社区意识。

### 2 设计框架

#### 2.1 地形学和文化分析

亚特兰大城市环路并不是地图上一条简单的线。这条环路是依据许许多多的独

立考量条件划定而成的。这些分析明确了环路在物质形态上的复杂性和空间上的丰富性，并表明新的流动性和公共开放空间方案将在环路中占据重要的地位。为了使亚特兰大城市环路的延伸能够在物质空间上整合起来，体现一种具有凝聚力的设计理念，同时为了融合沿环路分布的令人激动的各种社区和机遇，项目必须制定一个强大的设计框架，在这个框架内能够容纳许多不同的事物，激发各种不同的想法，并且能够促进充满活力的公共生活蓬勃发展。

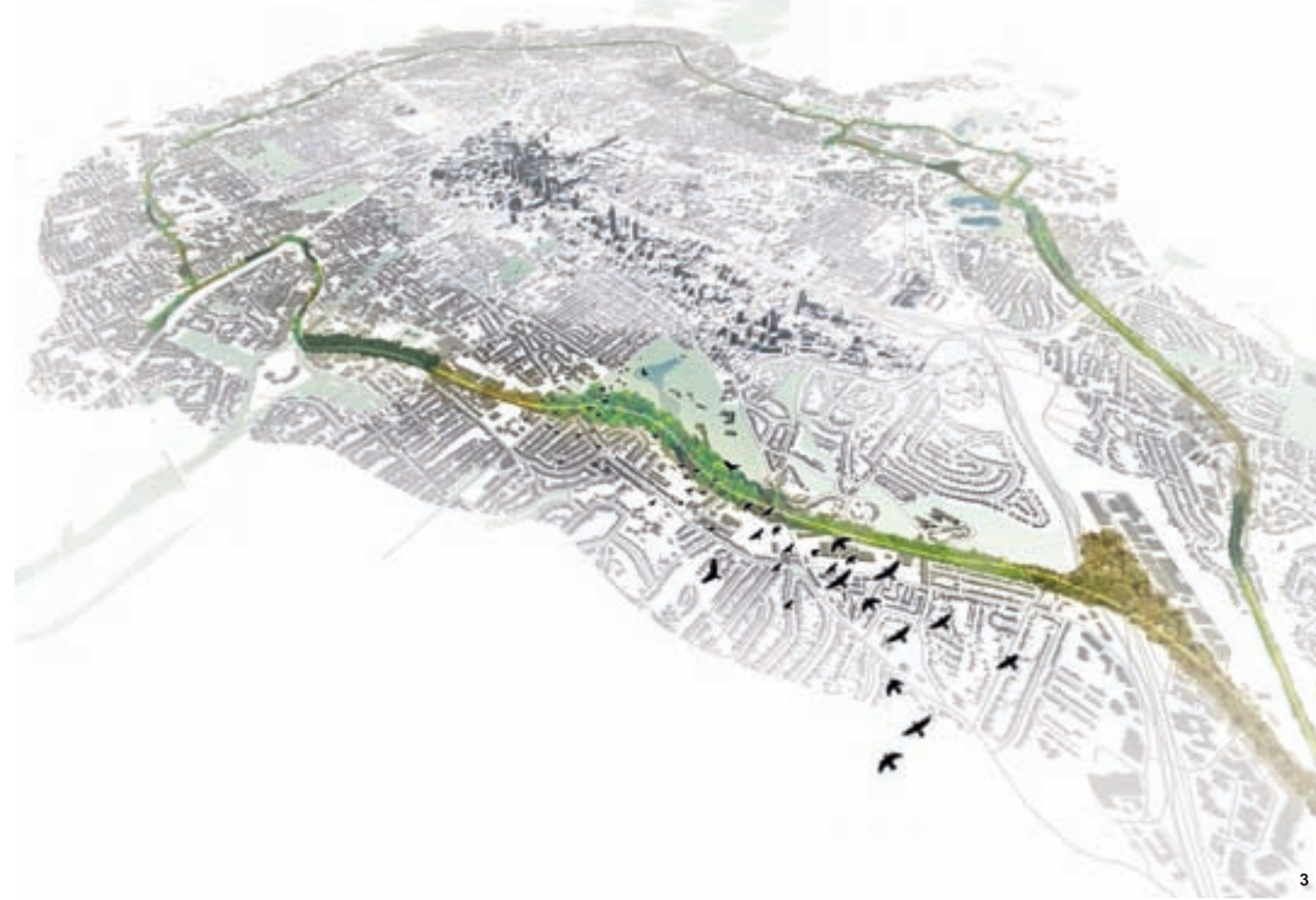
#### 2.2 连续性和多样性

作为这一系列分析的结果，设计团队确定了项目现有的两种核心特质：连续性和多样性。亚特兰大的主要铁路干线具有相对一致的体验：沿着山脊线进入市中心；而“城市环路”则绕过城市中心，穿

越佐治亚州皮德蒙特高原的丘陵和山谷，沿途经过丰富多样的空间环境。这些多样化的条件形成了一种可识别的空间片段序列，为设计的多样性提供了坚实的基础。

随着亚特兰大城市环路被赋予新的公共用途，其营造出了城市整体意象特征，并担负着引导使用者穿越城市及沿着道路通行的功能，因而保持连续性显得至关重要。这种新的连续性通过一系列设计元素进行表达，而这些元素都体现出了环路的历史特征：如交通导轨和车站、多功能步道，以及这一新的景观基础设施正常运行所需的各种元素——步行坡道、台阶、指示牌、栏杆、墙体和场地设施。设计的连续性将明确总体的物质空间特征，本项目也可借此成为一个可辨识的公共空间，并形成一种有别于城市周边环境的连贯城市形态。

作为总体性设计前提，连续性元素应



3

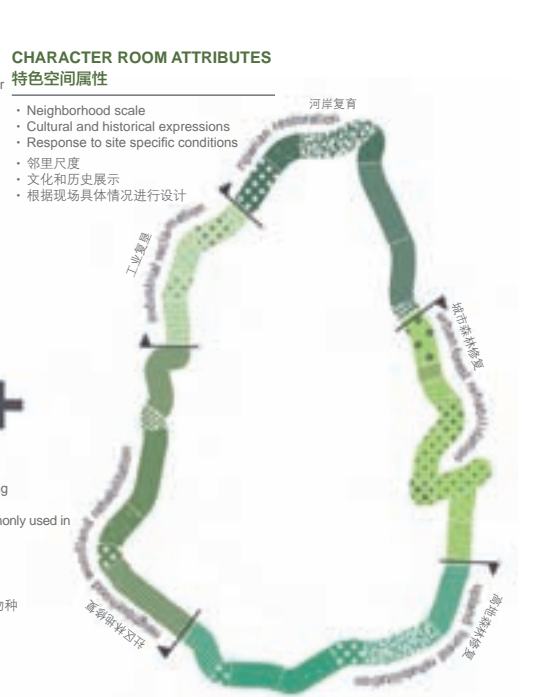
### CONTINUOUS CANOPY: REFORESTATION STRATEGY

连续林冠：再造林策略



### VARIED CHARACTER “ROOMS” AND DESTINATION

多样化的特色“空间”和旅游目的地



4

服从于人们体验的多样性，使景观和城市风光能够展现出环路振奋人心的一面。该框架制定出一个完全一体化的城市景观开发方案的各个阶段，能够展示其自身的设计层次，发挥环境效益，并能够成功地对环路的材料、结构和建筑形式进行整合。

### 3 景观设计层次

亚特兰大城市环路的景观设计包括4

个各有侧重却又相互关联的层次：营建开放空间网络和新建公园、采用城市森林原则、提出植物园设计概念以及打造特色空间。

本项目为解决城市缺少开放空间和新建公园的问题带来了独特的历史机遇。以使亚特兰大的绿色空间总面积增加40%为目标，亚特兰大城市环路将在项目实施的25年内新增近526hm<sup>2</sup>的新建公园和绿地。

- 项目鸟瞰模型图 © Perkins + Will
- 再造林策略及植物园规划图 © Perkins + Will
- 埃奇伍德桥现状 © Perkins + Will
- 麦克多诺隧道现状 © Perkins + Will
- 西部树林现状 © Perkins + Will
- Aerial model illustrating the extent of the project © Perkins + Will
- Reforestation strategy and arboretum plan © Perkins + Will
- Existing condition of Edgewood Bridge © Perkins + Will
- Existing condition of McDonough Tunnel © Perkins + Will
- Existing condition of west woods © Perkins + Will



5



6



7

长达53km的连续性多功能步道将最终连接起40座新建公园。

基于环路的主要条件，景观设计的第二个层次采用了城市森林原则，将整个环路划分成5个林冠再造区域。复育采用了最先进的设计方法，通过这种方法能够恢复植物群落完整的结构和功能。而修复的目的在于恢复生态系统过程、生产力并使之重新发挥功效，但无法重建一个完整的植物群落。复垦包括对退化区域进行植被重建以启动土地治理过程，但相比其他两种方法（复育和修复），其无法带来较丰富的生物多样性。

景观开发的第三个层次为建造一座空前的延绵35km的植物园——一个精心规划的、城市尺度的混合了现有的及栽培树

种的植物园，同时也是一座城市森林、一条生态连接带、一条科研廊道、一组令人难忘的公共空间，亦是一首以植物为基础的、讲述城市的悠久历史和多元社区的文化叙事诗。

最后，景观设计的第四个层次所建议的树冠形式、种植技术和树木布置契合了现有场地的特点、条件和特质，从而形成新的多样的“特色空间”。考虑到亚特兰大城市环路的平均宽度较窄——以及运输轨道的间隔要求——能够用于种植的空间通常非常有限。因此，为了在环路沿途创造出丰富多变的空间体验，设计运用了包括谨慎选取树种、混栽不同树冠大小的树木，以及调整树木的惯常空间维度等在内的技术方法。

#### 4 景观表现策略

除了能够提高其景观设计表现力，亚特兰大城市环路也将显著地改善环境状况，特别是在雨洪管理和缓解城市热岛效应方面。为了保障新建的多功能步道和运输轨道，战略性的、高效的沼泽地和排水设施对有效的雨洪管理将是非常必要的。项目在场地的渗透、蒸腾（通过植物吸收水分）和雨水再利用方面，利用了生态沼泽、雨水花园、地下储水系统等技术手段。

在一个城市的多功能运输环路中，针对缓解城市热岛效应方面的最大举措就是停止使用通常用于轨道底座的石质道碴和铺地。基于适应当地气候和环境条件的国际先例，亚特兰大城市环路将采用草皮轨道或所谓的“绿色导轨”来代替传统的轨道底座。这一景观设计形式将使用植被表面替代占地35hm<sup>2</sup>的碎石或混凝土铺地。除了能够形成绿色的、连续的地表平面，草皮轨道还将有助于增强雨洪管理、降低噪声和缓解扬尘。

#### 5 材料、结构和建筑形式

建成环境中的硬景材料及其表现形式是形成完全一体化的城市景观的最终要素。作为贯穿整个环路的连续性元素，它们将为亚特兰大城市环路项目提供一致的、可辨识的特征。

材料面板的选择基于4个标准：美观性、耐久性、材料本真性和易维护性。因此，要尽可能地避免使用油漆或抛光表面。相反，通过一系列简单而美观的材料——包括花岗岩、不锈钢、电镀铝、木头和特制的骨料混凝土混合材料——即可表达出色彩与质感的变换。这些材料在整个环路中反复出现，并根据设计需要和当地条件呈现出不同的形式和表达。

项目中的道路由特制的骨料混凝土混合材料构成，其中一半的道路经延缓剂和喷沙处理以创造出一种独特的双色外观。其他的硬景如公共广场、通行线路、次级道路和连接道路也使用了相同的铺面材料，包括花岗岩、混凝土和碎石砌面。

#### 6 社区参与和社区意识

除了改变城市的形式之外，亚特兰大城市环路产生的最深远的影响之一或许就是它跨越了城市中不同的社会区域，在富裕和贫穷的社区之间、在过去的工业废弃区和茂密的森林之间创造出了物质空间和象征意义上的联系，通过一个步道系统将从前只能依靠汽车到达的住宅、市场、教堂和学校连接起来。环路既是一条令人愉快的道路，也成为了一个旅游景点，它正迅速地成为城市中的一个标志性的公共聚会场所，一个以一种悠闲的步调和人性化的尺度来享受城市风光和肌理的空间。

“亚特兰大城市环路上的艺术”是众多有益于提高社区民众支持率的社区活动中的一项。目前这个活动已开展了4个年头，这是亚特兰大历史上规模最大的临时公共艺术设施，它为环路吸引了成千上万的游人。无论是参加沿东侧道路的5km长跑比赛、志愿参与“亚特兰大植树”（一个本地的非营利性组织）的周六植树活动，或是参与企业赞助的清洁活动，社区居民都在积极地推动亚特兰大城市环路项目获得成功。这些广泛的志愿者活动提高了公众的社区意识水平，并促进了主人翁意识的形成，以保证该项目能够成为真正



10

的公共设施。

通过全面地与其所连接的社区进行融合，并鼓励此类市民参与性活动，亚特兰大城市环路成为了景观基础设施如何创造积极的、长效的环境、经济和社会变革的典范，并为城市的未来建立了新的范式。LAF

8. 环路穿越街道交叉口轴测图 © Perkins + Will
9. 规划的廊道鸟瞰效果图 © Perkins + Will
10. 东部环路轨道设计平面详图 © Perkins + Will
11. 东部环路轨道设计效果图 © Perkins + Will
8. Axonometric of BeltLine cross under street intersection © Perkins + Will
9. Aerial perspective rendering of proposed corridor design © Perkins + Will
10. Plan detail of eastside transit design © Perkins + Will
11. Perspective rendering of eastside transit design © Perkins + Will



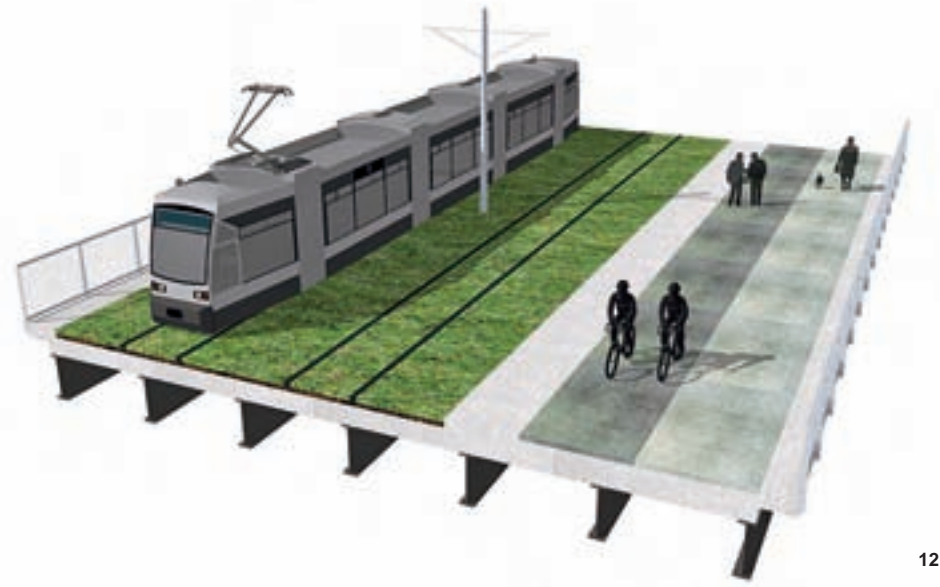
8



9



11



12



13

### 1 Project Overview

The Atlanta BeltLine is an ambitious, 25-year project that will transform a series of abandoned railroad corridors into a central organizing feature in the city of Atlanta, Georgia. It is a rare example of landscape infrastructure driving the redevelopment of a major urban center, bringing not only much needed transit services but recreational opportunities and commuting options. Implementation of the project consists of three major efforts: Development of a design framework in response to the physiographic

and cultural characteristics of the corridor; design of an integrated urban landscape from repurposed grey infrastructure; and community engagement and awareness.

### 2 Design Framework

#### 2.1 Physiographic and Cultural Analysis

The Atlanta BeltLine is no simple line on a map; the corridor is defined by dozens of individual conditions. These analysis make clear that the route is physically complex and spatially rich, and that the new program of mobility and public open space will provide

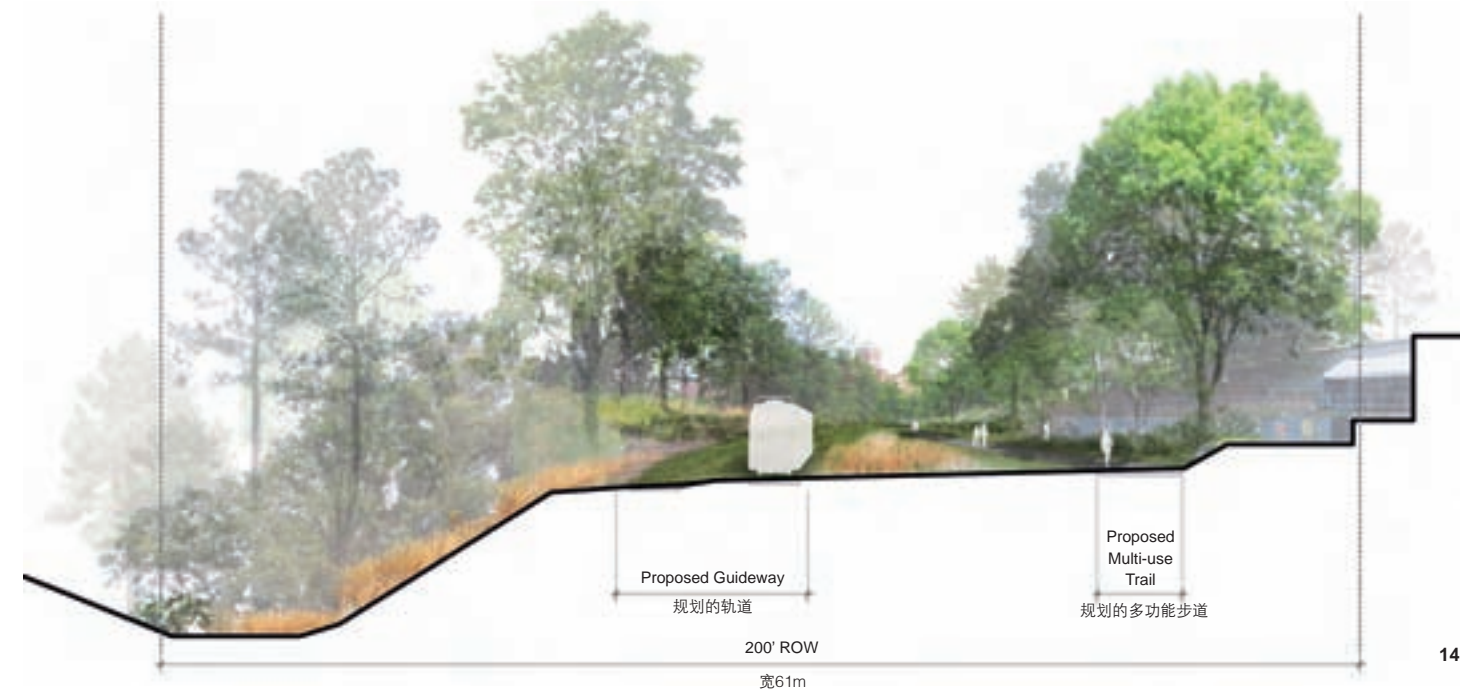
a strong presence in the corridor. In order for the expanse of the Atlanta BeltLine to hold together physically as a cohesive idea, and in order to engage the exciting variety of communities and opportunities along the way, the project must have a strong design framework within which many different things can happen, where ideas can multiply and where a robust public life can flourish.

#### 2.2 Continuity and Variety

As a result of these analysis, the design team identified two core characteristics of the existing Atlanta BeltLine: continuity and variety. Unlike Atlanta's mainline railroads that have a relatively uniform experience following the ridge lines into downtown, the "belt lines" bypass the city center and slice across the hills and valleys of the Georgia Piedmont Plateau, engaging a rich variety of spatial environments. These varying conditions define a recognizable sequence of spatial segments that offer a sound basis for design variety.

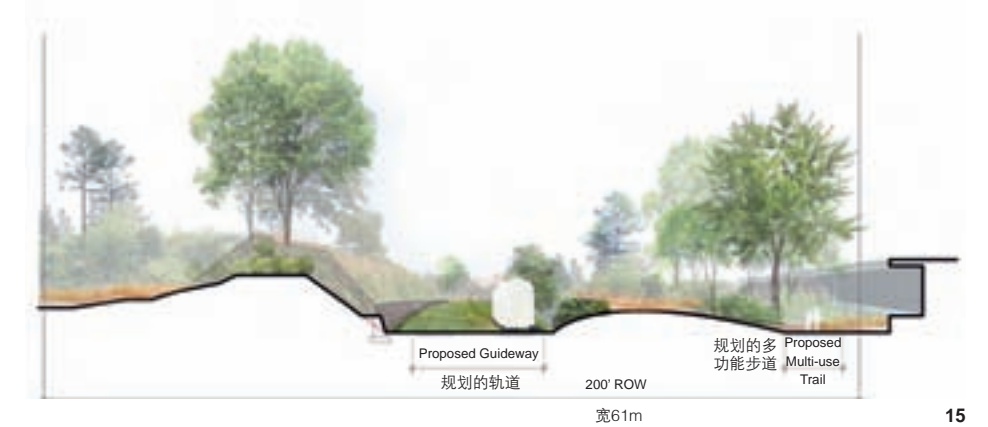
Maintaining continuity is essential as the Atlanta BeltLine is transformed into its new public purpose, creating an overarching identity and helping users navigate through the city and along the route. This new continuity is expressed in a small set of design elements that take their cue from the corridor's historic identity: the transit guideway and stations, the multi-use trail, and the elements required for this new landscape infrastructure to function — pedestrian ramps, stairs, signs, railings, walls and site furnishings. Design continuity will define an overall physical identity so that the Atlanta BeltLine becomes a recognizable public space and a coherent urban form that it is legible within the surrounding city.

As a general design premise, the continuity elements defer to the experiential variety, allowing the landscape and cityscape to



14

- 12. 典型的新建轨道和通行桥梁剖面图 © Perkins + Will
- 13. 绿色轨道、生态洼地和多功能步道效果图 © Perkins + Will
- 14, 15. 规划剖面图展示了多变的地形条件 © Perkins + Will
- 12. Section of a typical new trail and transit bridge © Perkins + Will
- 13. Axonometric of green tracks, bioswale, and multi-use path © Perkins + Will
- 14, 15. Proposed section illustrating variety of topographic conditions © Perkins + Will



15

express the excitement of the corridor. This framework sets the stage for the development of a fully integrated urban landscape, one that displays its own design hierarchy, achieves environmental performance, and successfully integrates the materials, structures and built forms of the corridor as part of a cohesive whole.

### 3 Landscape Design Hierarchy

The landscape design for the Atlanta BeltLine has been conceived on four distinct, but interrelated layers: the open space network

and new parks, urban forestry principles, arboretum concept, and character rooms.

The Atlanta BeltLine provides a unique and historic opportunity for the city to address its deficiency in open space and new parks. With a goal of increasing Atlanta's total greenspace by 40%, the Atlanta BeltLine will add nearly 1,300 acres (526 hm<sup>2</sup>) of new parks and greenspace over the course of the project's 25-year implementation. These new parks will be connected via 33 miles (53 km) of continuous multi-use trails, which will ultimately link 40 parks.

The second layer in the landscape design hierarchy applies urban forestry principles to divide the corridor into five canopy reforestation segments based on the prevailing conditions in the corridor. Restoration represents the most advanced approach whereby the full structure and function of a plant community is restored. Rehabilitation aims to repair ecosystem processes, productivity and services, but does not recreate a full plant community. Reclamation involves re-vegetation of degraded areas to begin the healing process for the land, but

with lower biodiversity than the other two approaches.

The third layer of landscape development will be an unprecedented 22-mile (35 km) arboretum — an elaborately curated, city-scale mix of existing and cultivated tree species that is at once an urban forest, an ecological connector, a corridor for scientific research, a collection of remarkable public spaces, and a plant-based cultural narrative of the city's rich history and diverse communities.

Finally, in the fourth layer of the landscape hierarchy, proposed canopy forms, planting techniques and tree arrangements respond to the existing site character, conditions and features to shape a variety of new “character rooms”. Given the narrow average width of the Atlanta BeltLine corridor — and the clearance requirements of the transit guideway — the space available for tree plantings is often limited. Careful selection of tree specimens, mixing of trees with varied canopy size, and adjusting typical tree spacing dimensions are some of the techniques that are being employed to create rich and varied spatial experiences along the

Atlanta BeltLine.

#### 4 Landscape Performance Strategies

In addition to its designed landscape expression, the Atlanta BeltLine will significantly improve environmental performance, particularly as it relates to stormwater management and urban heat island mitigation. To support the new multi-use trail and transit guideway, strategic and efficient swales and drainage features will be necessary for effective stormwater management. Efforts are made to infiltrate, evapotranspire (uptake of water by plants), or reuse stormwater onsite using techniques including bioswales, rain gardens, subsurface storage systems.

The largest single consideration in mitigating the urban heat island effect in an urban, multi-use transit corridor is elimination of the stone ballast or pavement that is typically used for rail beds. Based on international precedents which are adapted to local climatological and environmental conditions, the Atlanta BeltLine will utilize a turf track or “green guideway” rather than conventional rail bedding. This one

landscape design feature will substitute 3.8 million square feet (35 hm<sup>2</sup>) of crushed stone or concrete with a vegetative surface. The turf track will also contribute to improved stormwater management, noise reduction, and dust mitigation, in addition to the obvious benefits of a green, uninterrupted ground plane surface.

#### 5 Materials, Structures and Built Form

The hardscape materials and their expression in the built environment are the final component of a fully integrated urban landscape. Serving as the continuity elements throughout the corridor, they provide the Atlanta BeltLine with a consistent and recognizable character.

The materials palette was selected based on four criteria: appearance, durability, honesty of materials, and ease of maintenance. Consequently, painted and finished surfaces are avoided wherever possible. Instead, the palette relies on a simple but elegant family of materials consisting of granite, stainless steel, anodized aluminum, wood, and custom mixes of exposed aggregate concrete. Together, these materials appear and reappear throughout the corridor, assuming different forms and expressions based on the programmatic needs and local conditions.

The Atlanta BeltLine Trail consists of a custom aggregate concrete mix, treated with retardant and sandblasted on one half of the trail to create a distinctive, two-tone finish. Other hardscapes like public plazas, access routes, secondary and connecting trails also utilize a consistent palette of materials including granite, concrete and crushed stone surfacing.

#### 6 Community Engagement and Awareness

Beyond changing the form of the city, perhaps one of the most profound impacts



18

of the Atlanta BeltLine is the way it spans the diverse social terrain of the city, creating physical and symbolic connections between rich and poor neighborhoods, former industrial dead zones and dense forests, linking homes, markets, churches and schools that were previously accessible only by car. Both a pleasant route and a destination in itself, the Atlanta BeltLine is quickly becoming a signature public meeting ground for the city, a space to enjoy the sights and textures of the city at a leisurely pace and human scale.

Among the many community engagement initiatives contributing to the project's phenomenal grass-roots support is “Art on the Atlanta BeltLine”. Now in its fourth year, this is the largest temporary public art installation in Atlanta's history and it draws thousands of

people into the corridor. Whether running a 5 km race along the Eastside Trail, volunteering for a Saturday planting with Trees Atlanta (a local non-profit organization), or participating in a corporate-sponsored cleanup, community members are actively fueling the success of the Atlanta BeltLine. This broad range of volunteer programs increases the level of community awareness and fosters a sense of ownership to ensure that the project becomes a truly public amenity.

By becoming fully integrated in the communities it touches and inspiring this kind of civic engagement, the Atlanta BeltLine is a model for how landscape infrastructure can create positive long-term environmental, economic, and social change, and set new paradigms for the future of the city. **LAF**

- 16. 东部步道的花岗岩壁和不锈钢钢轨 © Perkins + Will
- 17. 东部步道的花岗岩拱座墙 © Perkins + Will
- 18. 东部步道的花岗岩墙体和游人 © Perkins + Will
- 19. 志愿者参与草地种植活动。© Trees Atlanta
- 16. Eastside trail granite wall and stainless steel rail © Perkins + Will
- 17. Eastside trail granite abutment wall © Perkins + Will
- 18. Eastside trail granite wall and people © Perkins + Will
- 19. Volunteer participate in meadow grass planting. © Trees Atlanta



19



16



17