
The Center for Human Mobility

Concept and Land Use Plan
Weston Nurseries Property, Hopkinton, MA

May 25, 2006

11.304 | Site and Urban Systems Planning

Marlon Aranda
Rajesh Kottamasu
Philippe Morgan de Rivery
Anna Wells

OVERVIEW

Hopkinton's proposed *Center for Human Mobility* is a center for study and practice, centered on physiology, muscular movement, exercise science, injury prevention, and family medicine. Promoting walking, running, cycling and swimming, the Center builds upon and enhances the town's athletic roots, promotes physical activity and health among its population, contains a medical/health collaborative, and provides a semi-public athletic facility for resident use. Our concept plan responds not only to the physical, but also the cultural landscape of Hopkinton, taking advantage of its regional identity, aging population, rural character and appreciation of nature. Given Hopkinton's history of shoemaking (town resident Thomas Walker invented a machine to attach soles to uppers in the 19th century), the large number of athletic shoe companies in the Boston metro area, and, most importantly, the regional and national identity of the site as the starting place for the historic Boston Marathon, we believe that a campus for an athletic shoe company or a human mobility research center, coupled with a Boston Marathon Museum would help solidify the Town's identity. These uses would also generate income and make available opportunities for public-private partnerships that could help to preserve more of the currently undeveloped nursery land. We believe that a diversity of uses and densities is beneficial from the standpoint of longevity in the face of changing markets, as well as being the most beneficial for the community in and around Hopkinton.

To that end, we propose a program consisting of a mix of a corporate/institutional campus, agricultural land, commercial/retail space, an educational facility, residential neighborhoods, open space, and passive and active recreational land. We have developed a series of clusters, or nodes, of different types of activities, while attempting integrating the uses throughout the 900-acre Weston Nurseries properties.

SITE ANALYSIS

The overall philosophy for designing the site is one of least disturbance; development should be focused where it would require the least tree cutting, re-grading, and wetlands disturbance. The State of Massachusetts and the Town of Hopkinton regulate activities in wetland areas and inside the 100-foot buffer zone; we further value these areas for wildlife habitat, groundwater recharge, their positive aesthetic qualities, and their passive recreation potential. These areas have been therefore placed off limits to development, and are considered an amenity of the property. Slopes, soil type, and aspect were also taken into account in creating this plan. Slopes above fifteen percent were avoided for building and soils deemed least suitable for development (i.e., would be most expensive to develop) were avoided.

Views both onto the site and from the site were taken into consideration in designing our concept. The charismatic view onto the site from Route 135 holds an important place for the Hopkinton community, and therefore should be preserved. We have held this area aside for continuation of nursery operations, a community supported agricultural operation, or both. Coincidentally, this area has a southwest exposure, ideal for growing crops. The sweeping, long-distance views from the northern-most portion of the site have also been exploited in designing the residential neighborhoods and the trails in that area.

DESIGN FEATURES

Our plan consists of several of nodes of land uses, some interconnected, but some unique. We believe the site can accommodate 300 acres of residential (at mixed densities), thirty acres of institutional or corporate space, twenty acres for retail/commercial and museum space, a school

and playing fields for the town of Hopkinton, a fifty-acre CSA, and 100 acres for ongoing nursery operations. We have set aside the remainder of the land, including wet areas, approximately 500 acres, to be conserved or used for passive or active recreation.

The main purpose of the conserved land is for a trail network that would support a model of physical and occupational therapy that combines the “ludic”, or “play” philosophy, and nature therapy. This nature-ludic therapy would be connected with the exercise science center we hope will make its home in the institutional campus we create toward the center of the property. We propose that the institutional campus house a research center, perhaps a *Center for Human Mobility* focused on physiology, muscular movement, exercise science, and injury prevention. Focusing on walking, running, cycling and swimming, the Center would enhance the Town’s athletic roots, promote physical activity among its population and provide a semi-public athletic facility for resident use. Considering this promotion of physical activity as well as the aging of the Town’s population, the Center has the capacity to facilitate rehabilitation and physical therapy as part of its research, both within its buildings and as incorporated with the trails. We appreciate the uncertainty involved in stipulating such a specific use for the campus, and understand that a Center for Human Mobility may not readily occupy the site. Nonetheless, our concept plan centers on a notion of healthfulness and appreciation for the land, and believe that the site is equally appropriate for a corporate campus and a public athletic facility, such as a YMCA. Considering that Hopkinton is the starting point for the Boston Marathon, coupled with the new athletic-associated uses we propose for the site, we believe this is an ideal location for a Boston Marathon Museum.

In keeping with the notion of healthfulness and an appreciation for the land, we also propose retaining fifty acres of the current Weston Nurseries holdings as farmland to use for community-supported agriculture. These fifty acres are on a favorable slope along Route 135, near the nursery operations that will continue, and should remain prominent in maintaining the rural character of the Town.

We have positioned several approximately fifty-acre nodes of residential development around the site. Most are of moderate density (2 du/acre), but some reach higher density (~4 du/acre). One of these nodes connects to the existing road on Curtis Street. We have designed the circulation here so as to minimize the traffic impact on the existing neighborhood. The other fifty-acre residential neighborhood nodes are new and will require new road and utility infrastructure. We have sited these nodes in relation to a trail network connecting them to each other, to the athletic facility and to the proposed Upper Charles Trail, again to promote human mobility through walking, running and biking. To further support these efforts and to preserve and enhance the transportation corridor that is Route 135, we have created a focal point along Route 135 near the intersection of Frankland Road. Near the existing Weston Nurseries Garden Center, we have placed the Boston Marathon Museum, land for the community-supported agriculture, and a farmer’s market.

Finally, we propose some innovative storm-water and wastewater treatment techniques. The entire site should be designed to maximize storm-water infiltration at the earliest stage of the hydrologic cycle: where the water falls to the ground. The residential neighborhoods should be designed so as to minimize impervious surfaces, using porous asphalt or permeable pavers where hard surfaces are necessary, and wherever possible maintaining vegetated land cover. We further propose the use of “Rain Gardens” in the residential neighborhoods. These are small areas between buildings or properties, vegetated in flood-tolerant species, that catch storm-water runoff from the adjacent land and allow the water to filter through the roots and soil, recharging

the aquifer. Any parking areas on the site (associated with commercial, institutional, corporate or residential land uses) should be covered in porous asphalt and use vegetated swales. For wastewater treatment, we propose the use of constructed wetlands and other innovative and alternative technologies, many of which the state of Massachusetts has certified for use (see <http://www.mass.gov/dep/water/wastewater/techsum.htm>).

CENTER FOR MOBILITY

Site A

Campus

The research institution at the heart of the concept plan has a unique opportunity: not only to conduct study on physiology, biomechanics, injury prevention and the like, but also to expand that research to the scale of lifestyle, community and the human relationship to the land. In this way, it conducts active living research while promoting a model of healthy living and mutual sustainability between people and place.

The campus of the Center for Mobility can then be justifiably used as a model for sustainable design. The buildings are oriented to minimize required grading, as well as to maximize views and exposure to sunlight (a further exercise of priority for daylighting and energy efficiency could impact on the actual design of the buildings). Two series of greywater filtration ponds are located on the campus and create centerpieces of the primary trail loops that center within the campus.

The total square footage of the campus is approximately 200,000 square feet, much of which could be one- or two-story buildings to correspond with the human scale of study. At least half of that square footage is dedicated to uses that mix public and private functions: the sports complex, the rehabilitation center, the amphitheater, and the health professionals offices.

Trails connect the various reaches of the site to the campus. There are usually at least two types of trail by which to access a given part of the site: a flatter trail to provide greatest accessibility across physical capabilities and modes, and a steeper trail designed for athletic training, research and hiking. The trails could be programmed as gravel fitness trails (with stations for different physical exercises or activities located along the trail) closer to the campus center and at the reaches of the site, while intermediate trails used primarily to move between parts of the site could be paved. Multi-use trails, incorporating both fitness and mobility uses, could use some compacted materials or gravel undergirded by weight-distributing support structures.

Residential Cluster

This cluster is nearest to the campus. Those who make that proximity a priority in selecting a location to live might include younger professionals and families who might take most advantage of the sports complex, trails and CSA, and older people who might take most advantage of the rehabilitation center, horticultural center (located on Site B), CSA and trails. The neighborhood is thus designed with an eye to affordability, walkability and maximized access to open space. It is composed of a series of duplexes, fourplexes and single family homes on 1/8 acre to 1/3 acre lots, with a gross density of about 7 units/acre and a net density of 3.4 units/acre. The homes are approximately 5000 square foot, 2- and 3-bedroom units. Shared parking courts in the fourplexes minimize curb cuts and provide varying degrees of intimacy among neighbors and help to mask the shared nature of the homes---in their design and typological variation, they can

look like single family detached homes from street level. The duplexes and fourplexes allow for reduced financial and environmental impact of utilities provision and maximize the availability of green space within each lot. Houses are further sited to provide ready access to shared or public green spaces. A club house at the center of the neighborhood provides residents the option of a larger interior space for special events. Whatever the population, those living in closest proximity to the campus seem likeliest to embrace the active living ideology and to welcome both the walkability of a denser site and the public porosity of the neighborhood, which allows the trails to wind through the center and northward past the limits of the property. Sidewalks on neighborhood streets allow further walking options for point-to-point travel.

Site C

Neighborhood Concept

From East Main Street (Rte 135), a new road with a planted median leads south past open space and playing fields to a new elementary school tucked in beside the wetlands. From this street stem several new residential streets, creating a neighborhood of approximately seventy small bungalow-style single-family homes, which are variable distances from the street to create visual interest. The residential streets follow existing paths on the property. They are tree-lined and narrow, and have sidewalks to facilitate walking, biking, and neighborhood interaction. The neighborhood is unified both by the presence of the school, as well as a network of trails and open spaces, and a series of playgrounds and playing fields for recreation opportunities. The neighborhood trails connect to the larger Hopkinton trail network, and the bike trail is part of the future Upper Charles Trail.

Densities and Parcels

The parcels in this neighborhood are just over $\frac{1}{4}$ acre. Some are deeper (150± feet) with less frontage (80± feet), whereas some are shallower (70± feet) but wider (120± feet). The parcels, where possible, are laid out according to existing delineated paths on the property. The density of the neighborhood, because of the abundant open space, is 2 units/acre.

Storm Water Management

At the site and street scale, we have maximized permeable surfaces in order to allow rainwater to infiltrate as soon as it falls. Storm water from the streets is detained in vegetated swales before discharging into the larger system. Parking surfaces, where necessary (e.g., near the playing fields, trail heads, and school), are permeable: grass, dirt, or permeable pavers. The larger, neighborhood scale system takes advantage of a natural swale at the center. This central valley, used in dry times for passive recreation, slowly funnels the water toward the wetlands, where it disperses.