Wayfinding Analysis and Master Plan for Future Signage Needs

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INTRODUCTION

Lorenc Design in association with Muhlhausen Design and Associates, have been retained by North Carolina State University to evaluate the effectiveness of the current campus sign program, establish a priority of signage needs, and make recommendations that will facilitate wayfinding around campus for all users. The University has expressed concern regarding the ineffectiveness of their exterior sign program that was developed in the early 1970's and the image the current signage is projecting. The existing program consists of flat aluminum panels pop-riveted to circular aluminum posts, black and white sign panels mounted to aluminum channels, and miscellaneous D.O.T. traffic control signs. Over the years individual sign programs have been separately developed for Carter Finley Stadium, College of Veterinary Medicine, and NSCU Arboretum that have no visual relationships to each other.

We applaud the University’s concerns about how its visitors are guided through the campus’s diverse environments and the image the current signage creates. Lorenc Design has been retained to address the University’s exterior signage needs by June 1996, however, we recognize that any effort directed toward this goal must take into consideration the University’s Identify Program, being separately created by the School of Design. Signs will be a major visual expression of this “new look”

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and need to be developed with basic identity design components, such as University service mark and/or corporate signature, color policy, and typographic standards, in hand. We urge the University to quickly move ahead with this identity effort and provide us with these key visual elements.

Wayfinding has been called “spatial problem solving” because it is really about people solving problems of how to navigate their way about in the built environment. This involves two aspects of information processing:

First, people have to be able to form cognitive maps in their heads to orient themselves as to where they are in a given setting (such as the campus), where their destination (such as, Admissions Office) is located, and how they plan to get there (Is it off Pullen Street? How do I get there. Where do I park?), and so on; this process is called “action planning,”

Second, people must be able to implement their action plans, finding their way to where they want to go easily, and with dignity – because all of us are not necessarily able bodied. This process is called “decision executing.”
The task of the wayfinding designer is to facilitate these processes; but before he or she can do this, there is the matter of establishing what the needs for communication are, wherein they may be currently deficient; and how to rectify that. This is the function of this analysis: a document that emerges from the data gathering process in which we have been engaged this past month. The principle is that when a person can clearly see and articulate all of their problems, they are at least half way to a solution. We bring it to the attention of the University Architect and Campus Planning that the recommendations presented in this report will most likely exceed the dollar amount the University wishes to expend for signage improvements this year. Consequently, we have assigned suggested priorities to our recommendations whose implementations should take place over a three-year period – giving highest priority to:

- Development of a standard campus map.
- Establishment of a landscaped Campus Gateway and smaller Centennial Gateways on Centennial Parkway and Avent Ferry Road.
- Implementation of properly sized identification signs at the Pullen and Alumni Gateways.

We will stress as one of our top priorities, the need to implement the new campus sign program throughout Centennial Campus.
The University Architect has developed a Physical Master Plan that divides the Campus into nine functional precincts and University Neighborhoods containing mixed-use areas clustered around courtyards and other open areas. The Master Plan proposes that through further development, each neighborhood would become distinct in character and diverse in function. While we applaud this concept in creating a series of people-oriented and accessible environments for the residents of the University, we find these designations lack significance as meaningful areas that can be used to facilitate the wayfinding needs of visitors. Those people we interviewed could identify the Brickyard and Court of North Carolina as visually identifiable areas and gathering places: they couldn’t identity the larger academic neighborhoods and precincts. When asked about meaningful landmarks that define the campus into identifiable areas; Hillsborough Street, the railroad tracks, I-440, and Western Boulevard were most frequently mentioned. However, there didn’t seem to be any established names for campus areas that were universally used, with the exception of Centennial Campus. Campus housing divided the area south of the railroad tracks in West, Central and East Campuses, which as we understood was based more on the number of students residing in each area, rather than defined by any geographic boundary.
A single campus base map that is more graphic than the ones currently being used needs to be developed for use by all University departments. The base map should divide the campus into areas based on meaningful landmarks, and each area should be named and identified by a unique color and/or symbol. Departments should have the opportunity to add an overlay of information to this base map that is unique and critical to their individual operations; thus the campus housing map would differ from the student parking map, which differ from the accessible route map, etc. Campus area terminology needs be consistently used in all verbal communication and signage.

The base map needs to display an aerial view of the entire campus and include all major highways leading to the campus, interior campus streets, campus buildings and names, a building directory, and parking areas. Each campus area is to be clearly shown in color and identified by name. Care should be taken not to highly stylize the map, nor include too much information as this will hinder comprehension.

There is value to taking a large complex area such as the University campus and dividing it into smaller campus areas that can be used as a communication device to more accurately locate a given destination. To be meaningful to visitors unfamiliar with the campus,
these areas need to be logically related to one another and geographically separated by identifiable landmarks.

We are recommending the campus area bound by Hillsborough Street on the north, Pullen Road on the east, Southern Railroad tracks on the South and Friendly Drive on the west be renamed *North Campus* and color coded Blue; the area bound by the railroad tracks on the north, Pullen Road on the east, Western Boulevard on the south, and I-440 on the west be renamed *Central Campus* and color coded Tan; the area bound by Wade Avenue on the north, and I-440 on the east be named *West Campus* and color coded Yellow; and the area bound by Western Boulevard on the north, Avent Ferry on the east, Varsity Drive on the south, and Gorman Street on the west be named *South Campus* and color coded Green. The *Centennial Campus* name would remain and the area would be color coded Purple.

The selection of campus area colors is based on the following criteria: first, the colors need to be easily identifiable by name (blue, green, purple, etc.); second, the colors need to be visually distinguishable and avoid color ranges which would cause problems for those with color deficiencies (red/green range being the most common); and third, to reinforce color/geographic associations (blue-cool-north, yellow-dry-west, green-lush-south). Purple is recommended for *Centennial Campus* as this color is already associated
**Problem 2**

The campus is poorly identified along major vehicular approaches and is difficult to find. Visitors are not always aware when they have arrived on campus.

With the campus identity through its banners and marketing brochures. Red is being reserved for “you are here” markers.

All campus area directives, signs located within a given campus area, and campus area maps would display its reference color to reinforce visitor orientation and comprehension.

This is a multi-faceted problem caused by the geographic spread of the University; campus buildings that are intermingled with residential, commercial and light industrial areas; inconsistent architecture; and poor signage.

The scheduled opening of Centennial Parkway next fall will provide visitors with clear easy access to the center of campus when approaching east or west along Interstate 40. We see this approach becoming the “new front door” to the University. Consequently, Campus Planning needs to begin working with NC Department of Transportation to relocate current guide signs for NC State University from the I-40/Gorman Street exit, eastward to the exit at Lake Wheeler Drive. To reinforce traffic patterns and improve the visual experience of visitors along this route, a major gateway feature is required on Centennial Parkway at the point traffic enters the campus. We are recommending this gateway be named Centennial Gate and display the new identity
of the University through the use of architectural materials, landscaping, lighting, and graphics.

Although the existing Alumni Centennial Gate at Western Boulevard and Gorman Street has not reached its full potential due to inadequate landscaping and its proximity to commercial areas, this dynamic structure located on a major campus approach that serves approximately 60,000 cars daily, will reach its full potential as the campus expands west along Western Boulevard. University and gateway names need to be applied to the fascia of this structure as the present stone clad identification sign is improperly located and too small. Approval to apply dimensional letters to this structure should be sought from the Committee responsible for the implementation of this gate before addressing the issue with the Raleigh City Council. Presently lacking are D.O.T. guide signs along Interstate 440 to direct traffic to exit at Western Boulevard and head east toward the campus.

The ceremonial campus gate and certainly the most desirable one from an image viewpoint, is the Pullen Gate. Once serving as the front door to the campus when the majority of visitors arrived from downtown Raleigh via Hillsborough Street, the Pullen Gate has become less important as a major campus entry and as we have been told, has become a difficult destination for visitors to find. We do not recommend changes to
the existing brick columns other than adding an identification sign and ground lights to improve nighttime visibility.

Secondary vehicular campus entry points on the perimeter of the campus including entrances into Centennial Campus from Centennial Parkway, Dan Allen Drive from Hillsborough Street, Pullen Road from Western Boulevard, and Sullivan Drive from Gorman Street need to be clearly signed with smaller scaled secondary gateway signs. Following this logic, the intersections along Western Boulevard at Dan Allen Drive, Morrill Drive, and Pullen Road will now become major intersections requiring inter-campus directives.

Identification of campus boundaries and areas can be provided by erecting uniquely shaped street signs at all intersections along City and State right-of-ways and within the campus proper. In addition to displaying street names, each sign should display the campus area where the sign is located. The current sign code permits private street signs, providing restrictions regarding sign legend, minimum letter size, reflectivity, and location are followed. We encourage the University to begin installing these signs when existing signs are replaced.
Pedestrian campus area gateways along Hillsborough Street and under the railroad tunnels should have smaller gateway identification signs adjacent to established pathways identifying the respective campus area, and including a directive to an information kiosk.

Vehicular and pedestrian gateways located adjacent to the City of Raleigh and NC D.O.T. right-of-ways need proper identification. It is our current understanding that the City of Raleigh has not permitted the University to erect identification on the brick columns at the Pullen Gate, nor on the fasciae of the Alumni Gate structure due to sign code restrictions. We understand that past University requests to the City for identification signs at major campus entries has been put aside when other requests for major expansion projects are being considered. The University needs to be more proactive when considering future signage requests.

Through highway field testing for Baltimore County, Maryland in 1968, researchers discovered the primary factors for determining the size of road signs are driving speed, the number of traffic lanes, and reaction time. Reaction time is the time it takes a motorist to identify a sign in the environment, read its message, and respond to that message through some action such as applying the brakes, turning off the road, etc. The reaction time on a four land road was determined to be 10 seconds. Thus, an automobile traveling on
a four lane road similar to Hillsborough Street at 35 mph would cover a distance of approximately 51 feet per second or a total of 510 feet while responding to a signed message. Assuming a conservative viewing distance of 1 inch of capital letter height for every 50 feet of viewing distance, letter sizes for the primary signed messages located along Hillsborough Street will need to be approximately 10 inches high and 13 inches high along Western Boulevard.

Sign panel size is a factor of the message size being displayed. Assuming a message consists of 25 square 10 inch high letters, the area of graphics that message will occupy will be 15.9 square feet. It is a rule of thumb in the sign industry that the area of graphics should not exceed 40 percent of the sign panel area in order to permit a sufficient background for the message to be read within the environment; thus sign panels located along Hillsborough Street should be no less than 40 square feet and 75 square feet along Western Boulevard.

The current zoning for the campus is Office and Institutional - 1. O & I (1) permits low profile ground signs up to a maximum size of 70 square feet, at a height not exceeding 3.5 feet, and displaying a copy size no larger than 4 inches. These restrictions will not permit the size signs required to insure safe viewing distances.
Consequently, we strongly recommend that the University approach the Raleigh City Council and request an amendment to the current code that would permit educational institutions more lenient signage options.

Due to the geographic spread of the University and its labyrinth of non-continuous and one-way campus streets, the concept of a primary centralized parking area for visitors is unrealistic. Currently, the Riddick Lot and its adjacent Information Booth are difficult to find and their locations in the eastern section of the North Campus is clearly not convenient for all visitors. This condition has been exacerbated by illegible City approved directional signs posted along Hillsborough Street.

The University should consider the construction of two Visitor Welcome Centers, one located along the east side of Centennial Parkway and the other located on the south side of Western Boulevard east of the Varsity Drive intersection. Each Center would consist of an area similar to a rest stop having two traffic lanes and be of sufficient length to accommodate a back-up of five to eight cars. An enclosed structure similar to the existing Information Booth should be located on the driver's side of the left lane and be served by an attendant familiar with the campus layout. The proposed sites for the Centennial Gate and Visitor Welcome Center on the side of Centennial Parkway are shown above.

Visitors are being guided to a single parking/information area that is difficult to find. Interior campus streets are hard to navigate by automobile: a situation worsened by the lack of properly sized directional signs.
Consequently, implementation of this Center will require University acquisition of property on the east side of Centennial Parkway. We believe the proposed site for the Western Boulevard Center will fit on University property.

Visitor Information Centers would permit a visitor to drive up to a window to receive verbal assistance, or view a campus orientation map and building directory that identifies and directs directions to the appropriate nodal parking area. We recommend that Riddick,
Brooks, Harris, Coliseum Deck and the various parking rooms at Centennial Campus be identified numerically and designated as nodal parking areas.

All visitor lots should be free to visitors. The current policy of gating visitor lots on campus should continue and be modified to allow automatic entry, but require a token to be acquired from the party being visited, to exit. The current visitor parking policy at Centennial Campus requiring the visitor to obtain a hanging pass and mounting it to their rear-view mirror, is at the very least, inconvenient. Although it is not within our responsibilities to suggest a parking policy for Centennial Campus, we do believe that gating visitor parking rooms runs counter to the image they want to present.

Vehicular Directives to Nodal Parking Areas

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PROBLEM 5

Finding a specific building on campus is difficult for visitors and new students.

Unmanned orientation kiosks should be prominently placed at all nodal parking areas, campus courtyards, academic neighborhoods, Wolfline bus shelters, and pedestrian campus gateways. Each kiosk should display a campus map, a detail map of the immediate area where the kiosk is located, and a complete campus building directory. The detail map should show adjacent buildings, streets, pathways, wheelchair accessible routes, bus line stops, architectural landmarks, and a “you are here” marker. We believe the placement of orientation kiosks within courtyards and neighborhoods will provide the University with an opportunity to establish official names for these areas and reinforce the village-like centers proposed by the Physical Master Plan.

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Kiosk Maps and partial Directory shown.

Full Campus Directory to be shown at each kiosk location.
Problem 6

Existing campus signs are difficult to read and their appearance reflects poorly on the image of the University.

Signs and their messages need to be sized for the environment in which they are being viewed.

Campus signs need a single graphic identity and graphic language that is flexible in layout to handle all the various message needs at both the academic and Centennial Campus areas. The appearance of the new campus signs and choice of construction materials must be upgraded from that which is currently existing.

We recommend that the University Identity Program currently being developed be expedited to enable the development of the Campus Signage Program as an extension of this effort. We are hopeful that the Identity effort will permit the use of an unique sign shape that will enhance sign visibility under adverse lighting conditions.

Signs and their messages need to be sized for the environment in which they are being viewed. As previously mentioned, legibility is a factor of viewing distance and reaction time, and the criteria for proper legibility is different for vehicular and pedestrian oriented messages. A building identification sign of a given size and located on a pathway within the campus may be perfectly legible for a pedestrian, but totally illegible when placed adjacent to a major highway. The choice of ADA compliant alphabet styles, letter sizes, letter spacing, interline message spacing, and color contrasts between the sign panel and the message need to be based on accepted viewing criteria.
Problem 7

Campus buildings are not always identified at the primary use door. Many secondary building entrances lack any identification.

Code required street numbers are missing.

Building identification signs are to be posted at all architectural front entries. If space is available, these signs should be free standing and positioned perpendicular to the primary building approach. If space is not available, or if the building entrance pathway is not clear, a smaller fascia applied sign identification is to be located immediately to the right of the entrance door at a height of 60 inches (to the center of the sign) above the entry threshold. These signs should display the building and college names, street number, a listing of contained departments and disciplines, and campus area identification.

A separate 3 inch high street number is to be uniformly located on the side of the building facing the street and within 18 inches of the building entrance, or if not possible for architectural or building arrangement reasons, prominently displayed on the building wall and easily visible from the street.

All other building entrances need to be identified by a door sign displaying the building name and campus area identification.

Academic Building Identification

Sign Type 8

$2,500 - $4,000.
Centennial Campus has a different constituency from the academic campus areas. Their corporate tenants want and should have greater latitude in the ways they are permitted to identify themselves on signs, and be able to do so in a way that presents positive images for themselves, Centennial Campus, and the University. It is obvious that the current sign standards do not permit this.

We recommend a visual consistency across everything that is labeled NC State University and recognize there is a need to balance the identities of Centennial Campus and its tenants within the overall signed image of the University. This means Centennial Campus needs to respect the graphic theme being developed for the Campus Sign Program, i.e.: identity logo, sign shapes, color, project alphabet, layout, etc.; however, be permitted to use upgraded materials, more extensive landscape treatments, different sign mounts, and different forms of sign illumination. Whereas the signs on the academic campuses may utilize reflectible graphics on formed metal sign shapes, Centennial Campus signs need to look more substantial and include internal illumination.

The use of corporate logos and colors on Centennial Campus directive signs or large scale billboard type directories at vehicular decision points, is not recommended. Visitors should be guided to individual
Single building tenants will be able to display their logo, on a standard free-standing building identification sign and mount a larger corporate logo on the fascia on the building.

Tenants or buildings via a standard street numbering system similar to the approach taken at Research Triangle Park. Multi-or academic tenants would be identified at the building site by the building or tenant name and corresponding street number. Pedestrian oriented tenant directories should be placed within adjacent visitor parking rooms to permit viewing from a parked vehicle or on foot. Single building tenants will be able to display their logo, on a standard free-standing building identification sign and mount a larger corporate logo on the fascia on the building. The placement and colors of the fascia mounted logo should be respectful of the architecture and provide sufficient (70 percent) color contrast. Illumination for fascia mounted signs must be concealed and non-dynamic.
We commend the University for the obvious strides they have taken to create an accessible and safe environment at NC State. While the ADA signage issues cited in this report are not serious, their corrections are readily achievable and should be addressed as soon as possible.

All accessible parking signs must be located at a height where they will not be obscured by a parked vehicle. We noticed examples of improperly mounted accessible parking signs at McKimmon Center. Pathways to accessible building entries are marked with building fasciae applied signs; however, several times we noticed these signs were not conveniently located so an individual in a wheelchair could easily spot them. Some were hidden behind dumpsters and others were mounted too high. While this is not in direct violation of the law, an effort is needed to position signs so each accessible pathway is clearly marked. Adding the building name to this sign type is needed to further clarify that the route to one building is not that to another.

ADA requirements for exterior and interior signs are generally the same. Exterior signs are not required to have tactile and Braille lettering, other than in a situation where a sign is needed to designate a permanent room such as a toilet facility which is only accessed from the outside. Exterior signs must meet requirements for letter proportions, sign finish and
Problem 10

There is a proliferation of campus signs displaying too many negative messages.

color contrast. Upper and lower case letters may be used. The current blade signs utilize a complex typestyle, not a “simple serif” style as required by ADA. Since the term, “simple serif” has no typographic meaning, we assume it means “moderate” rather than “exaggerated.” The tight letter, word and interline spacing of the messages on the these signs are problematic and contributing to poor legibility.

We have observed that critical signs directing visitors to campus entry points and parking areas are grossly lacking and the installation of directional and identification signs needs to be placed high on the priority list when new signage is considered: However, the spread of regulatory signage on campus has gone unchecked. Too many signs are just as detrimental as too few signs and the solution rests in finding a proper balance. A procedure exists for the production and installation of building signs and we recommend this same procedure needs to be applied to traffic signs. All campus signage requests need be funneled through Campus Planning in order to maintain control and not procured by separate departments as currently being done.

We understand there is a need for strongly worded messages on parking signs. These messages need to be reserved for life and safety issues. All other messages regarding, towing information, reserved parking,
prohibitions against bringing umbrellas into sports events, no smoking, etc., need to be consistently presented in a more positive form. A sign can only inform. Only swift action by campus security personnel will provide the necessary enforcement.

Retail establishments need the ability to express individual identities by permitting a choice of lettering styles, symbols, colors, and lighting within a framework of appropriateness to the type of activity, compatibility with the surrounding architecture, and legibility.

Finding a particular retail activity in the environment can be facilitated if signs identifying that activity are similar in style. Thus, if all food service areas were permitted to use exposed neon, while signs for general merchandise stores were limited to non-illuminated panels, a distinguishable character would be created that would announce these as different activities. It is important when permitting style distinctions that the signs and mounts are visually compatible with their surroundings and sensitive to the architecture. Whereas in the Central Campus, signs suspended from canopies and mounted to fasciae of buildings may be appropriate, signs located in more historic areas of the campus should be independent from the architecture whenever possible.
We are aware that available funding will govern the extent to which recommendations can be implemented this year. Consequently, we are proposing a phasing-in period, based on the priorities as we see them, of three years to make improvements to the existing campus signage and, hence, to the traffic flow on-site.

Mapping and designation of the various campus areas has been placed first on the list, is because it forms the platform for the overall wayfinding program and will generate discussion time. It is followed by number 2; creating and identifying Campus Gateways on Centennial Parkway, Western Boulevard, and Pullen Road. Number 3 is a priority of equal, if not greater, urgency which has to do with implementing the new sign program on Centennial Campus. Recommendation 4 involves coordination with NCDOT to provide necessary guide signs from the interstate system. Subsequent recommendations 5 through 13 follow in order of importance for the years 1997 and 1998.

It should be brought to your attention that the design theme for the campus sign program cannot be finalized before there is an approved consensus on the basic design components for the new identity program. All effort should be made to expedite this identity effort as quickly as possible.
PRIORITIES FOR 1996

1. Develop a standard campus map that can be used for all print materials and signage.

2. Implement a Campus Gateway on Centennial Parkway and add NC State identification signs to the Alumni and Pullen Gates.

3. Implement the new sign program at Centennial Campus, including a new Centennial Gateway along the Parkway.

4. Work with N.C. Department of Transportation to provide guide signs at interstate exits at I-40 and Lake Wheeler Drive and I-440 at Western Boulevard.

PRIORITIES FOR 1997

5. Provide vehicular directive signs and identification signs for all visitor nodal parking areas.

6. Provide orientation kiosks at all nodal parking areas in the North and Central Campuses Brickyard, and University Student Center. Add maps to Wolfl ine bus shelters.
7. Implement all building identification signs and install code required building numbers.

8. Change out all campus street identification signs using the new signage standard.

9. Revise all wheelchair accessible route signs to include building name and relocate, if necessary, to more clearly define these pathways.

10. Construct new Visitor Information Centers at Centennial Parkway and Western Boulevard.

11. Provide additional orientation kiosks at all pedestrian gateways and other academic neighborhoods as required.

12. Replace all reserved parking area signs on campus using the new signage standard.

13. Implement all remaining sign types.

Priorities For 1998