#	Revision	Date

Purpose and Scope 1.1.1

The purpose of this volume of the Signage Standards and Guidelines is to outline general criteria for the design and/or fabrication of signage within the airport services buildings of Boston-Logan International Airport (BOS). This is intended to meet the particular needs of the airport services buildings area while maintaining overall design cohesion with the signage system airport-wide.

Adherence to the standards of this document and official Massachusetts Port Authority (Massport) policies and procedures will ensure consistency throughout the signage system at BOS.

Signs Regulated by this document include:

- All exterior directional, identification, and informational signs for public use throughout the support facility areas within the Airport property, including:
  - Roadways
  - Property Entrances
  - Activity Areas
  - Buildings
  - Tenants

Signs NOT Regulated by this document include:

- Terminal(s) (see Volume 1)
- Curbside (see Volume 2)
- Ground Transportation (see Volume 2)
- Parking (see Volume 3)
- Roadways (see Volume 4)
- Vehicular pavement markings
- Vehicular regulatory
- Rental car facilities
- Non-public areas

#	Revision	Date

Purpose and Scope cont'd. 1.1.1

This volume is organized in four main sections: Overview, Graphic Standards, Sign Types, and Appendix.

- **Overview** - includes an overall explanation of the signage program as well as the purpose and scope of the volume.

- **Graphic Standards** - includes general specifications applicable to all sign types, which include:
  - TYPOGRAPHY - application and standardization for all typography used on directional, informational, and identification signage.
  - TERMINOLOGY/SYMBOLOGY - includes all terminology and symbology that shall be used in the Airport Services Buildings signage.
    MESSAGE HIERARCHY - includes message hierarchy for each category organized by sign types. Those categories are: Primary Messages, Secondary Messages and Tertiary Messages.
  - ARROW STANDARDS - includes arrow sizes, application on directional signage, orientations and placement.
  - COLOR STANDARDS - listing of all colors, paint equivalents, and transparency/ opaque vinyl specifications that shall be allowed through the terminal areas.

- **Sign Types** - specific sign layout information and application guidelines:
  - IDENTIFICATION SYSTEM - includes all the sign type series numbering and specific break down for the sign type numbering within each series.
  - GRID LAYOUTS - includes the grid sizes used to determine the sign types sizes.
  - MOUNTING REQUIREMENTS - descriptions of all the mounting styles that shall be used in the terminal areas are given. Specific application or special circumstances are delineated.
  - SIGN TYPE INDEX - sign descriptions and specifications referencing sign layouts and details.
  - SIGN TYPE LAYOUTS - includes sign face layouts, elevations and mounting descriptions.

- **Appendix** - may include forms, graphics, and/ or supplemental information relevant to this specific volume. It also includes circulation diagrams for the airport services buildings areas.

#	Revision	Date

Governing Codes and Standards 1.1.2

Governing codes, city ordinances and standards affecting the Boston Logan International Airport (BOS) signing and graphics system are outlined below. The following list of requirements have been compiled from the various governing codes affecting Boston-Logan International Airport. This list is not to be assumed as a complete list of requirements. If there is a conflict between a requirement listed below and another authoritative code or standard, the more stringent one shall be applied. This section is for reference only, and it is the designer's responsibility to meet all current applicable codes or regulations.

General Regulation Requirements

- In all rooms or areas where smoking is prohibited, plainly visible "NO SMOKING" signs (using either the verbiage or symbol, or both) shall be posted.
- Elements and space of accessible facilities which shall be identified by the International Symbol of Accessibility are:
    - Parking spaces designated as reserved for individuals with disabilities
    - Accessible passenger loading zones
    - Accessible entrances when not all are accessible (inaccessible entrances shall have directional signs indicating the route to the nearest accessible entrance)
    - Accessible toilets, when not all toilets are accessible
- An eggshell finish (11 to 19 degree gloss on 60 degree gloss meter) on sign faces is recommended.
- Illumination levels on sign surfaces shall be in the 100 to 300 lux range (10 to 30 foot candles) on interior signs, and shall be uniform over the sign surface. Signs shall be located such that the illumination level on the surface of the sign is not significantly exceeded by the ambient light or visible bright lighting source behind or in front of the sign.
- Characters and numbers on signs shall be sized according to the viewing distance from which they are to be read. The minimum height is measured using an upper case X. Lower case characters are permitted unless noted otherwise.
- For Braille signs the letters and numbers shall be raised 1/32" minimum, upper case, san-serif or simple serif type and shall be accompanied with Grade 2 Braille. Raised characters shall be at least 5/8", but no higher that 2". Pictograms shall be accompanied by the equivalent verbal description placed below the pictogram. The border dimension of the pictogram shall be 6"minimum in height.
- Each door to an exit stairway shall have tactile signing that states EXIT and complies with ANSI.

#	Revision	Date

Governing Codes and Standards cont'd. 1.1.2

AAAE	American Association of Airport Executives
AASHTO	American Association of State Highway and Transportation Officials
ACC	Airport Consultants Council
AIGA	American Institute of Graphic Arts
ANSI	American Nationals Standards Institute
ASTM	American Society for Testing and Materials
ATA	Air Transport Association of America
AWI	Architectural Woodwork Institute
CAA	Civil Aeronautics Administration
CAB	Civil Aeronautics Board
CABO	Council of American Building Officials
CSI	Constructions Specifications Institute
FAA	Federal Aviation Administration
FHA	Federal Highway Administration
IATA	International Air Transport Association
NEMA	National Electric Manufacturers Association
NFPA	National Fire Protection Association
MHD	Massachusetts Highway Department

Governing Bodies and Authoritative Organizations

Figure 1.1.1

ADA	American with Disabilities Act
ANSI	American National Standards Institute, Inc.
LSC	Life Safety Code (written by NFPA)
MBC	Massachusetts Building Code
MUTCD	Manual of Uniform Traffic Control Devices
NEC	National Electrical Code (written by NFPA)
SPC	Standard Plumbing Code (written by NFPA)
SBCCI	Standard Building Code
UBC	Uniform Building Code

Codes and Regulations

Figure 1.1.2

#	Revision	Date

Design Criteria 1.1.3

The design criteria for Boston Logan International Airport (BOS) is organized into sections which outline the procedures and requirements for development of a successful signage system to guide visitors through the airport facilities. These principles for design are intended to inform and instruct in properly establishing the signage standards and guidelines for airport services buildings at BOS. This part of the document should be used as a basis for and supplement to the graphic standards to create a uniform and cohesive signing and graphics system for Boston Logan International Airport.

In development of the signage design for BOS, the following list of design requirements/ criteria should be applied to all the sign types:

- Methodology
- Wayfinding Factors Process
- Consistent Sign Placement
- Consistent Legibility

Methodology:
To comprehensively program the airport wayfinding, an in-depth analysis of the facilities and circulation has been conducted, and Wayfinding methodology also has been established which CB has already included in these guidelines. All major airport facilities should be reviewed in a holistic approach to ensure wayfinding consistency throughout. The methodology begins with this review:

- All airport facilities plans (plans and elevations)
- Space functions
- Circulation paths
- Peak load circulation
- Established Nomenclature and Terminology
- Established Message Hierarchy
- Vertical and horizontal circulation
- Primary destinations
- Physical complications
- Connecting passengers verses Origin & Destination

NOMENCLATURE AND TERMINOLOGY:
The first issue that has been taken into account is the Nomenclature and Terminology. Terminology identifying airport functions and space has been standardized and established*(See section 2.2 in Graphic Standards)*.

MESSAGE HIERARCHY:
Hierarchy of messages exist for primary, secondary, and tertiary messaging. Ranking was based on routing or destination priorities and site, or space specific direction(s). The message hierarchy established in this document shall be used to develop message schedules for future signage *(See section 2.3 in Graphic Standards)*.

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Design Criteria cont'd. 1.1.3

Methodology cont'd:

GRAPHIC STANDARDS:
The Graphic Standards section of this document shall be used as established in this document for the design of future signage *(See section 2.0 Graphic Standards)*. Included in the graphic standards would be documentation of:

- Font type, size relationships, kerning, spacing, etc.
- Symbols
- Arrows, types and relationships
- Language relationships and ranking
- Clear space
- Graphic element spacing
- Color, color coding
- Branded colors if applicable
- General materials consideration

SIGN TYPES:
The sign type family is the catalog of all directional, identification and informational signage applications. It functions as a tool for programming signs and allows for a much more effective process *(See section 3.0 Sign Types)*. This section includes primary and secondary sign types for:

- DIRECTIONAL SIGNS - Signage designed to facilitate circulation to and/ or from a specific destination within the airport complex.
- IDENTIFICATION SIGNS - Signage designed for identification of specific areas or spaces within the airport complex.

Future signage shall be designed based on the sign types included in the Section 3.0 of this document. Information regarding acceptable sign sizes and mounting requirements is also included.

#	Revision	Date

Design Criteria cont'd. 1.1.3

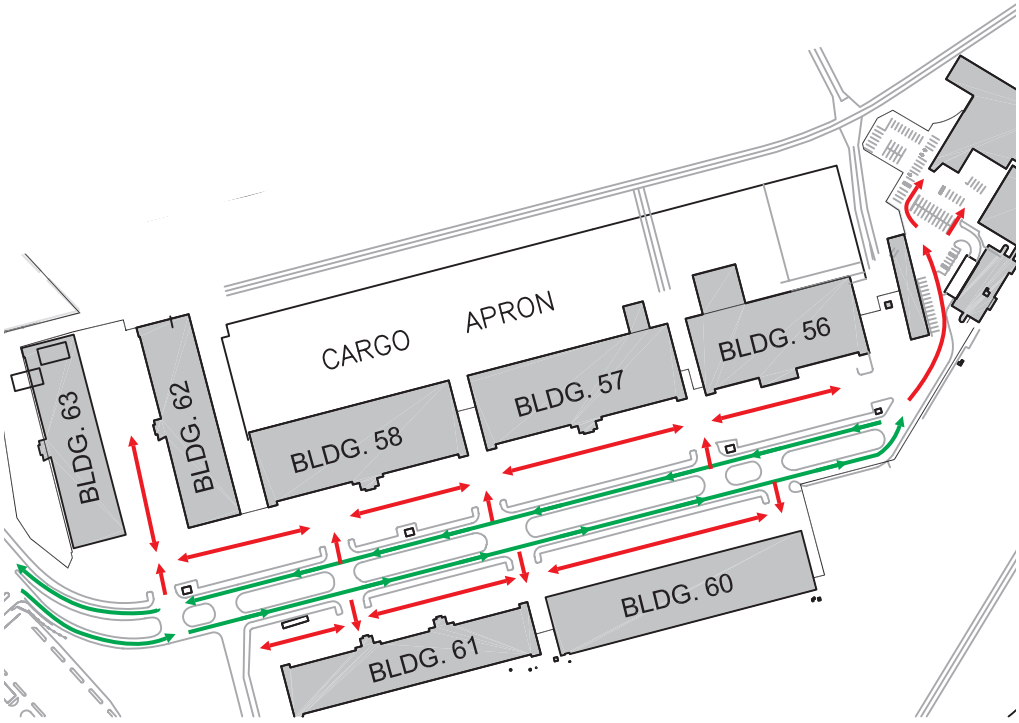
Wayfinding Factors:

The ability to orient and navigate through the various airport environments is fundamentally important. Wayfinding brings into play the analysis of spatial relationships and circulation studies.

CIRCULATION ANALYSIS:

Incoming and Outgoing (or Enplaning and Deplaning) circulation for major user groups shall be charted by the designer of the sign system. Points of origin and destination will be referenced as the basis for identifying critical decision points and information requirements.

Primary user circulation routes are depicted as green lines arrows, pointing in the direction of the traffic flow. The red lined arrows depict the secondary circulation routes that might occur at direction changes.



Circulation Flow

Figure 1.1.3

Traffic Flow Key		
Primary Flow	Secondary flow	Decision Point

#	Revision	Date

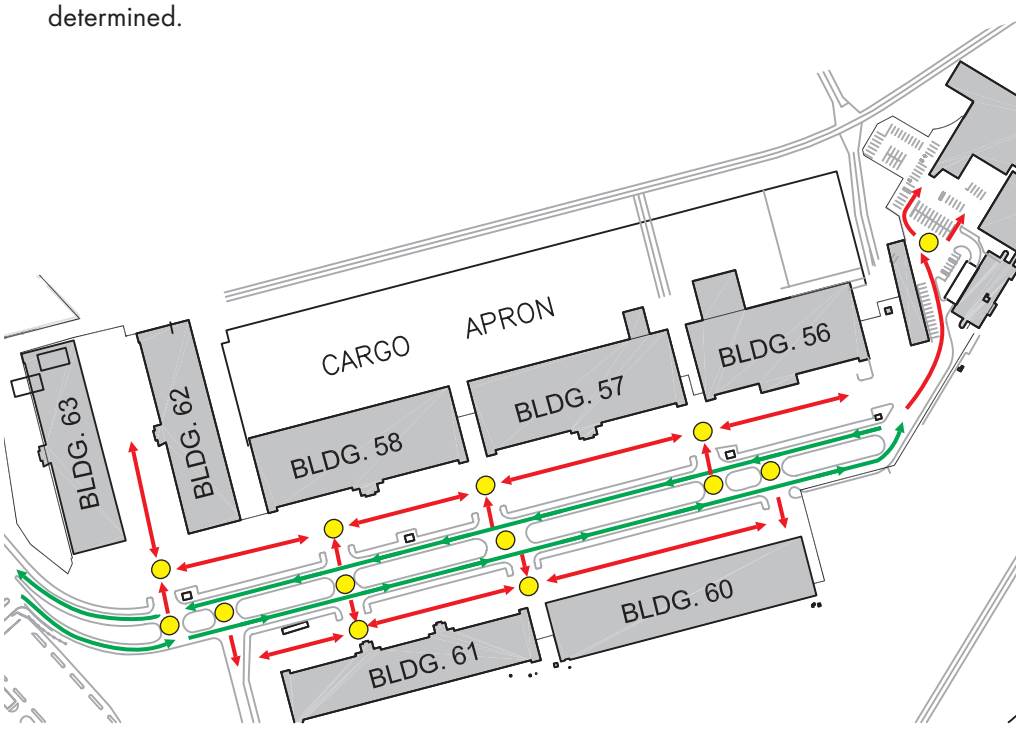
Design Criteria cont'd. 1.1.3

Wayfinding Factors cont'd:

IDENTIFICATION OF DECISION POINTS:
Decision points along user circulation routes shall be located at required direction changes and points where the user encounters alternative choices.

Examples of decision point locations within the existing complex are shown as yellow circles at primary and secondary intersection/directional changing areas. These areas are the most optimal location for placing directional signs that inform the viewer of the existing alternative pathways.

DETERMINING REQUIRED INFORMATION AT DECISION POINTS:
The type of information required at or preceding each decision point should be determined. In addition, the location of messages identifying destination points should be determined.



Circulation Flow

Figure 1.1.4

Traffic Flow Key		
Primary Flow	Secondary flow	Decision Point

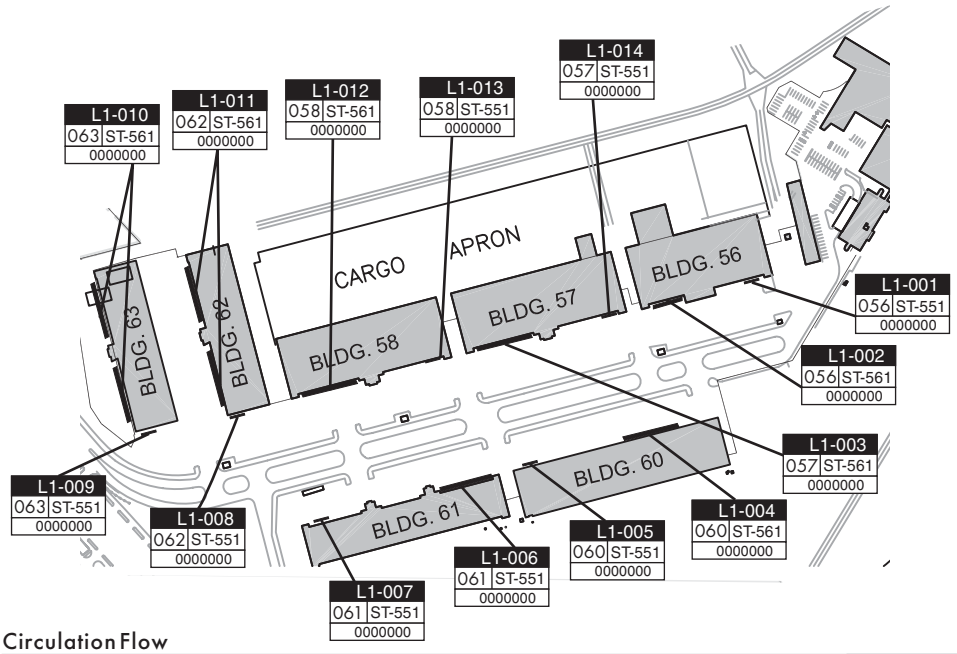
#	Revision	Date

Design Criteria cont'd. 1.1.3

Wayfinding Factors cont'd:

IDENTIFICATION OF SIGN LOCATIONS

Plans, cross sections and elevations of Airport Services Buildings and surrounding roads shall be analyzed by the designer of the sign system. A final sign location plan should then be determined.

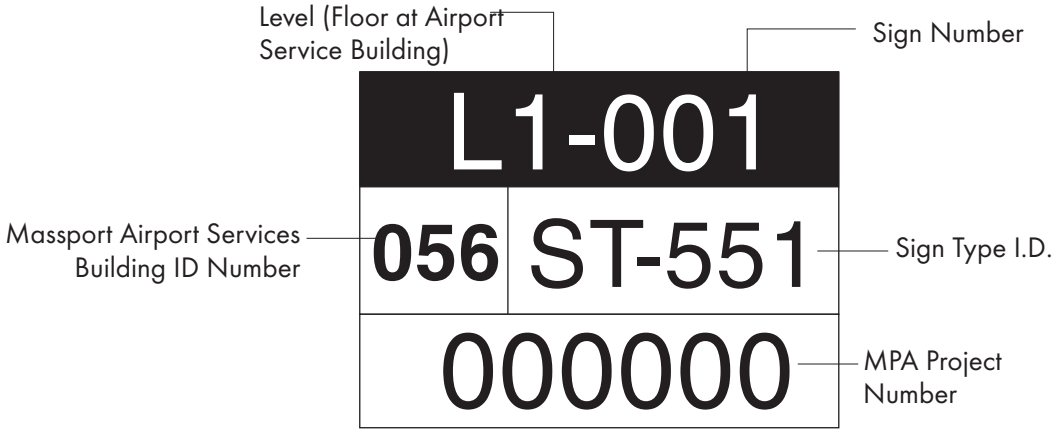


Circulation Flow

Figure 1.1.5

SIGN LOCATION INDICATORS

The following system should be used to identify each sign type and its location on the plans. Each sign shall be given an Airport Service Building ID number, a floor level of the building, an identification of its type and a sequential number for the plan. This will assure that a consistent sign location system is used from designer to designer.



Sign Location Indicator Example

Figure 1.1.6

#	Revision	Date

Design Criteria cont'd. 1.1.3

Wayfinding Factors cont'd:

DELIVERABLES:
Upon completion of the steps mentioned before, the designer shall provide the Airport with detailed drawings and information for the following:

- Circulation Analysis
- Identification of Primary and Secondary decisions points
- Detailed locations of each one of the signs to be constructed and implemented
- Signage database using the Sign location indicator system *(See figure 1.1.5)*

These shall be included for each facility within the Airport property where signage is being developed for. (Terminals, Curbside, Parking, Roadways and Airport Services).

The documents listed above are a compliment to the deliverables necessary to construct the signs (i.e, Sign layouts, message schedules, mounting specifications, construction specifications, etc...) which shall also be provided by the designer.

A detailed list of submitals shall be agreed on between the Authority and the designer prior to commencement of the project.

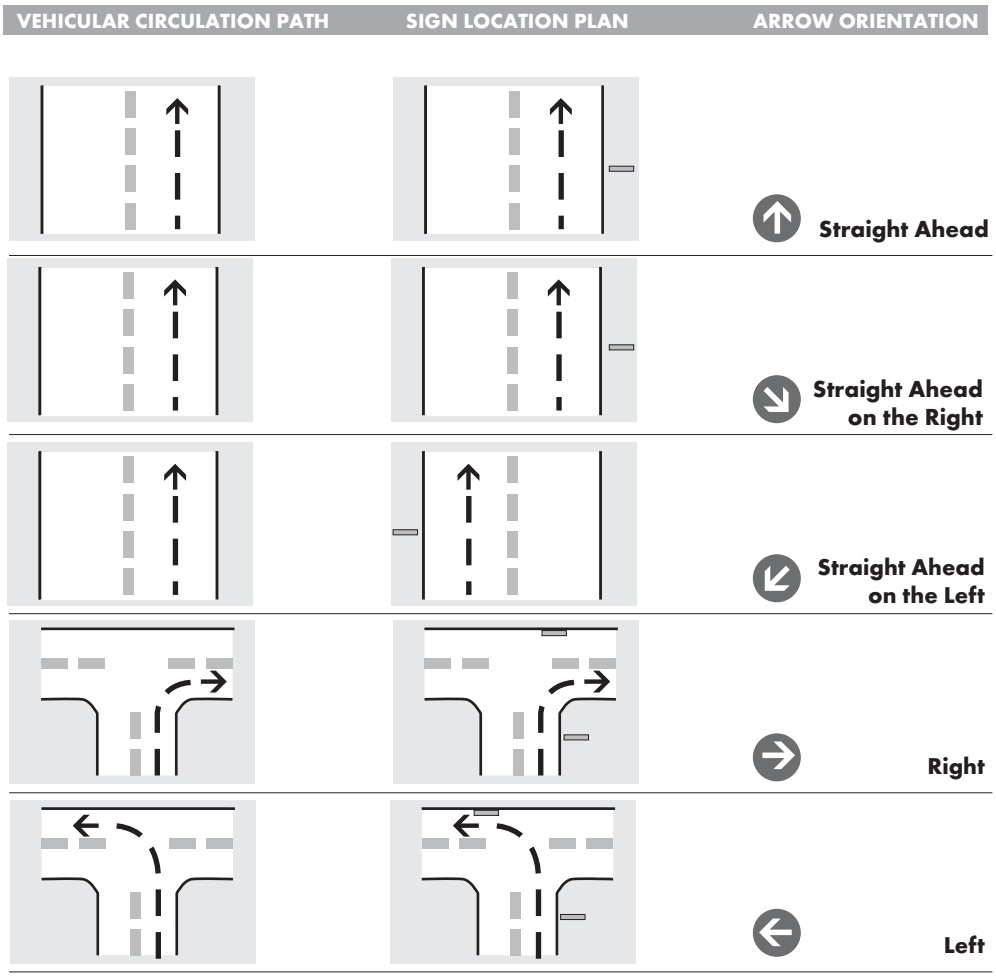
NOTE: This document is intended to be a guideline only. Each designer is expected to complete their due diligence in the design of all signage support structures and related items.

#	Revision	Date

Design Criteria cont'd. 1.1.3

Vehicular Sign Placement:

Viewer circulation patterns and natural lines of vision are the basis for determining the location of all signs. Signs shall be located to precede decision points to ensure sufficient time for vehicles to react to each sign message.



Sign Placement (con't)

Figure 1.1.7

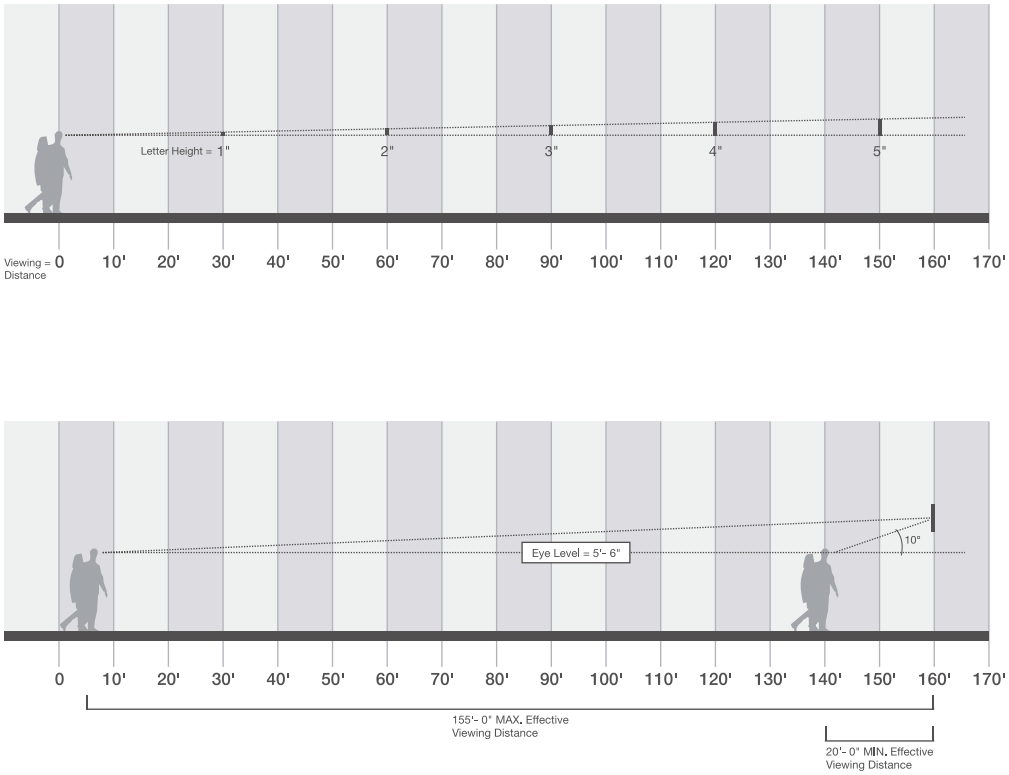
#	Revision	Date

Design Criteria cont'd. 1.1.3

Legibility:

Legibility is another important factor within the process of securing an effective signage system. "Legibility" is defined as the recognition of the various elements that make a message or symbol understandable without the aid of additional wording or preconditioning. The following sections set the criteria for legibility related to pedestrian signs. The factors affecting legibility include sign placement, lighting, and color contrast.

It is necessary to have a consistency in placement and presentation of messaging on signs, as well as floor to ceiling height and size of sign. This will minimize the unintended interpretation of the pathways and uses of the facility. The sign location will dictate the range of visibility available for the viewer to interpret the information. If the viewer is given the appropriate distance to comprehend the messages, he/she will be able to make a decision to change direction or stay on the same pathway. It is also necessary to create a consistent size for text and symbols throughout the facility. This will create a repetitive display of information which, in turn, will make interpretation and comprehension easier. *(See Figure 1.1.8 for viewing distances)*



Viewing Distances

Figure 1.1.8

#	Revision	Date

Design Criteria cont'd. 1.1.3

Legibility cont'd:

The following criteria and principles shall be applied to the design of traffic signs to convey messages adequately to the driver:

- Signs shall be easy to detect or attract the driver's attention. The most important information needed by most drivers, requiring the most immediate decision, shall be emphasized.
- Signs shall be legible under all conditions including day, night and inclement weather, and when seen at a glance. Simple verbal messages and symbols are more legible than complex ones.
- The message shall be clearly presented, with no sources of misinterpretation and ambiguity. The message shall not depend on a high order of logical deduction for its comprehension.
- The design of the sign shall be such that the information can be quickly rejected by those drivers not needing it.
- Legend and location shall conform to the drivers expectation based on pre-trip planning or previously obtained information, signs seen earlier, and subjective evaluation of the driving situation.
- Each type of information shall be ranked for its importance to the driver and this hierarchy shall be expressed in the use of color, size, shape, message from and in rules governing location.
- The system shall prepare the driver in advance for turning decisions and upcoming road and traffic conditions. Sign location shall allow adequate time to act on the information.
- Information requiring different types of action by the driver shall be conveyed differently.
- Signs shall be installed only where the information is needed. Overuse of signs results in mistrust.
- The use of all codes and forms of message content shall be uniform throughout the system.

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#	Revision	Date

Design Criteria cont'd. 1.1.3

Legibility cont'd:

Minimum viewing distance shall be affected by horizontal and vertical viewing angles. It is recommended that advance guide (directional) signs be spaced at least 800 feet apart, however that distance shall be lowered to 650 feet as speeds are reduced.

The legibility formula for determining letter height on roadway signs is as follows:

Exterior signs reference:

$$H=\frac{(N+6)V}{100}+\frac{S}{10}$$

H=Height of letters in inches
N=Number of Messages
V=Vehicle Speed in miles per hour
S=Lateral Distance from driver's path

Example: If a vehicle is traveling
25 MPH and the sign is 15'-0"
From the driver's path, the letter height
On the sign shall be calculated
Using the same following formula:

$$H=\frac{(6+6)\ 25\ (MPH)}{100}+\frac{15\ (Lateral\ Distance)}{10}$$

$$H=3+1.5$$

$$H=4.5\ Inches$$

Vehicular Legibility Formula

Figure 1.1.9

#	Revision	Date

Change Procedures / Sign Replacement 1.1.4

Scope and Process for Signage Review

The following explains the scope and process for signage review.* TAA sign types are not goverened by the Guidelines and therefore should not fall under the review process. Aviation Projects, Operational Signage and Communications Projects may or may not need to comply with the Guidelines depending on project goals.

Signage projects should be addressed within the following contexts: Tenant Alteration Applications; Aviation Projects; Communication Projects; Operational Requirements and Capital Projects; the processes for developing Signage scope and design are described below.

Tenant Alteration Application: For a TAA Aviation Administration and Development's projects, the TAA Project Manager is the lead. The TAA Project Manager coordinates with the Manager of Aviation Signage at the inception of each project (whether large or small) to determine if the project will require signage. In some cases the Project will be required to develop a Signage Plan, in other cases Aviation Signage would provide the needed signage. The approach would be case by case.

Aviation Projects: Aviation Projects are lead by various staff within Aviation. The Project Manager meets with the Manager of Aviation Signage and all other stake holders at the inception of each project (whether large or small) to determine if the project will require signage. The Aviation Signage Manager works with stake holders and Project Manager to determine with signage is required and the best methodology for fabrication and whether to do work in-house or use outside vendors.

Communication Projects: For Communications Projects, various staff within Aviation and Communication takes the lead. The Aviation/Communications Team meets with the Manager of Aviation Signage and all other stake holders at the inception of each project (whether large or small) to determine if the project will require signage. The Aviation Signage Manager works with the stake holders and Team to determine what signage is required and the best methodology for fabrication and whether to do the work in-house or use outside vendors. Communications is responsible to provide design.

Operations Requirements: Operational Requirements include Parking, Ground Transportation, Security, Airline Changes, and the Airport Directory System. Aviation Signage Manager is the lead and is responsible for scope, design, fabrication, and installation.

Capital Projects: In a Capital Project, the lead person is the Project Manager. The Project Manager should meet with the Manager of Aviation Signage at the inception of each project (whether large or small) to determine if the project will require signage. In some cases the Project Manager will be required to develop a Signage Plan in other cases Aviation Signage would provide the needed signage. The approach would be case by case.

Provided by Massport on December 17, 2004.

#	Revision	Date

Change Procedures / Sign Replacement* 1.1.4

PHASE 1	Review Tasks	Details		Detail Tasks
Review by: Aviation Admin and Develop. Capital Programs Communications	Does Project Require Signage? If yes, what types?	Permanent	Scope	Wayfinding Location Identification Regulatory/Informational
		Temporary	Scope	Construction Signage Wayfinding
		Marketing/Communications	Scope	Roll Out
	How will signage be funded?	By Project? By Aviation Signage? By Communications?	Scope	Funding
	Does Project drive Signage Changes outside of Project Limits?		Scope	Wayfinding Location Identification Regulatory/Informational
	If so, how will signage be funded?	By Project? By Aviation Signage?	Costs	Funding Funding
	Assignment of Signage Tasks	Project Manager Designer Fabricator		

PHASE 2	Review Tasks	Details	Detail Tasks
Review by: Aviation Admin and Develop. Aviation Business Aviation Signage Capital Programs	Circulation Diagrams	Arriving	Horizontal Vertical
		Departures	Horizontal Vertical
	Identify Critical Intersections		
	Develop Wayfinding Path Requirements		

PHASE 3	Review Tasks	Details	Detail Tasks
Review by: Aviation Admin and Develop. Aviation Business Aviation Signage Capital Programs	Draft Sign Matrix	Sign Number Sign Type Sign Message	
	Draft Sign Location Plan		

PHASE 4	Review Tasks	Details	Detail Tasks
Review by: Aviation Admin and Develop. Aviation Business Aviation Signage Capital Programs	Refine Sign Matrix	Sign Number Sign Type Sign Message	
	Refine Sign Location Plan		
	Design Sign Face Layouts		

Change Procedure / Sign Replacement

Figure 1.1.10