A METHOD FOR ANALYSIS AND DESIGN OF VISUAL SEQUENCE EXPERIENCES FOR PEDESTRIANS IN THE CITY

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ABSTRACT

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Submitted to the Department of City and Regional Planning of
the Massachusetts Institute of Technology on 20th September,
1966 in partial fulfillment of the requirements for the degree
of Master in City Planning.

The aim of this thesis is to demonstrate the need for and the applic-
ation of, a method for designing the city from the pedestrian's point of
view.

The modern city, increasingly encircled and sub-divided by the
inaccessible edges of vast motorways and other super-human scale elements
is rapidly becoming entirely inhospitable for the man-in-the-street.

Somehow, the external urban pedestrian environment, that is, the place
of man in the outdoor world of the city is being overlooked in urban design
practice. Somehow, the right bag of tools has not yet been assembled to
enable the designer to make plans for the overall visual form of cities
or for the sequence experience of the observer moving through them.

This thesis develops a framework for analysing the perceptual form of
the pedestrian environment. It poses criteria for design through which
evaluations can be made of the problems and opportunities in existing
pedestrian environments. It then applies the analysis framework to a
case study section of the city and makes design proposals which are
developed on the basis of the analytical-evaluative process. These
proposals are then reviewed in terms of their implementability.

Finally, the method, techniques of application and findings are
reviewed for overall consistancy, and suggestions are made for refining
them.
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I would like to record my appreciation in being exposed to the rigorous intellectual climate generated by Professor Kevin Lynch whose works, studios and seminars contributed to the approach taken in this thesis.

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While lodgin in the city take o'er
12th July Celebrations (1986) Belfast.
I. CONTEXT OF STUDY

1. THE PROBLEM

Impressions of the city are a complex synthesis of visual/sensory and other types of experience conditioned to a large extent by our familiarity level of a few of its parts or of certain routes through the city.

For the most part our knowledge of the city is gained as we move along its major path system and from our visits to its principal centres. We are principally observers in motion reading the city form as an unfolding sequential experience as we drive or walk through it.

If we are visiting a city for the first time and self-consciously wish to comprehend its form and component parts quickly, we normally drive around its boundaries seeking to establish its limits and its association with surrounding countryside. We aim to determine its functional order, its principal centres, landmarks, and paths. We then make systematic reconnaissances along its major paths, revealing the hierarchical structure of its parts and centres.

In cities where the structure and form of its component parts is clear and legible, our comprehension level is potentially greater. Where, however, there is a lack of contrast in structure and form, our understanding is complicated and confused. We are frustrated by our inability to orient ourselves and to establish our identity in it. In situations where we can quickly and easily orient ourselves, much of our energy can be redirected into gaining a deeper and more coordinated grasp of the city and of its elements.
This study is concerned with the perceptual experience of the pedestrian in the city and seeks to develop a method for analysing and evaluating the sequence experience along pedestrian paths with a view to identifying problems and opportunities as the basis for formulating design proposals.

The inspiration for this study in the first instance was this writer's concern over the apparent dullness, ugliness, confusion, discomfort and danger typifying much of the pedestrian environment in the majority of our contemporary cities. Secondly, it was felt that considerable visual potential lay unexploited in the modern city, largely through the inability of city designers to rationalise and communicate in visual terms beyond the context of the single building or building complex.

The aim is to seek the means by which we can identify and communicate the basic visual problems and opportunities in existing city form and through this, intelligently design a visually harmonious and challenging environment for the urban pedestrian; to enable the meaning and process of the city to be easily grasped and to structure the city in such a way that people can orient themselves as they move through the city on foot.
2. OBJECTIVES OF THE STUDY

The main aims of this study are the following:

(i) Develop a framework for perceptual analysis and evaluation of the pedestrian environment through which visual problems and opportunities can be systematically identified.

(ii) Expose the visual problems and opportunities in a CASE STUDY area through application of the method.

(iii) Make design proposals for selected CASE STUDY paths and centres.

(iv) Test the proposals for feasibility and the method for its usefulness.
3. PROCEDURE

The procedure adopted for this study involves the following stages:-

(i) Definition of the problem area - analysis of the visual component of the Pedestrian environment into basic elements and qualities.

(ii) Formulation of objectives for designing for the perceptual experience of pedestrians in the city.

(iii) Development of more specific criteria for pedestrian paths and centres.

(iv) Survey and analysis of a CASE STUDY area with the application of posed criteria to identify and evaluate visual problems and opportunities.

(v) Preparation of summary diagrams of problems and opportunities.

(vi) Resolution of problems and opportunities through a design synthesis exercise developing design proposals for the CASE STUDY area.

(vii) Sketch designs of alternative solutions.

(viii) Test feasibility and implications of proposals and suggest strategies through which such proposals can be made implementable.

(ix) Re-examine the feasibility of utilising a visual analysis approach in urban design.

From the above procedural outline it will be seen that the initial part of this study is concerned with defining the elements of the perceptual environment which can be demonstrated to be basic to the construct of the pedestrian's visual experience in the city and as such can be evaluated in terms of performance against a set of yardsticks or
criteria. The elements of our concern are both physical in terms of the urban structure and qualitative in the sense of 'experience', eg. noise level, spatial scale etc.

The definition of design objectives and criteria for the pedestrian's perceptual environment follows the preliminary analysis of the problem area. These are based upon what were considered to be the primary aims of a design exercise for the observer in motion and are developed specifically for application to existing urban conditions as opposed to new urban areas.

The analytical and evaluative framework, as developed above, is applied to a CASE STUDY area. This involved field survey and sequence photography, undertaken by this writer in the role of a trained observer. Evaluations were made through application of the criteria in terms of visual problems and opportunities. The evaluations made are subjective, in that they represent the judgements and experience of this writer only. An important sequel to this study would have been the use of a citizen questionnaire system, against which the observation made in the survey could have been tested against those revealed in a questionnaire sampling.

Summary drawings of the evaluations made in the CASE STUDY area bring focus upon the major problems and opportunities. These are utilised directly in the design process through which physical manipulation of the environmental structure to achieve objectives is proposed. The main departure from the normally adopted urban design procedure is in the method of evaluating problems and opportunities. The emphasis here is in achieving clarity of perceived form, contrast in visual/sensory experience and meaning from the total sequence of events on a walk through a section of the city. This study attempts to approach the urban design problem more highly self-conscious of what an observer actually sees and feels.
on walking along the urban pedestrian footpath. Through such an approach to the design of the city, it is felt that we can achieve heightened awareness of the urban problem and develop solutions which will, more clearly, reflect the order and nature of those using it.
II. METHODOLOGY

1. FRAMEWORK AND ANALYSIS

Analysis of the urban perceptual/sensory environment of the observer on foot is concerned with both constant fixed and variable non-fixed elements or states. The breakdown includes both environment and fixtures and forms the basis of the approach to reducing the problem into a number of component areas for systematic study.

The classification includes the following categories:-

(i) Components of Environmental Form.
(ii) Visual/Sensory Qualities of Environmental Form.
(iii) Kinesthetic Variables.
(iv) Perceiver Variables.

(i) Components of Environmental Form

The classification used is based on that of Lynch, with some minor modifications. The components are identified through their visual identity and are not based upon geographic boundaries or empirical location. They are classified further into:

ENVIRONMENT: Districts
             Centres
             Paths

ENVIRONMENT/SPACE: DEFINING ELEMENTS:
                   Edges (2 & 3 dimensional)
                   Seams (2-dimensional)

ORIENTATION ELEMENTS: Landmarks (Structural/Associational)
ENVIRONMENT

Districts: Visual districts are areas of some determinable and over-riding visual quality or character for which there is widely acknowledged consensus. The internal visual experience will clearly be different within an identified district. A district will also be perceptibly differentiated from the outside. A centre or path within a district will assume the over-riding quality of that district. Because of its clearly differentiated character, a district will be used by observers for orientation purposes.

Centres: A centre may be viewed as a small district in that it will have characteristics which will differentiate it visually and functionally from its surrounds. It is a gathering place or focus for activity most frequently occurring at cross-roads, or travel mode change points where activities tend to diversify as well as to increase in intensity. Centres are also characterised in terms of their spatial form and increased scale to meet activity space demands.

Paths: A path is a surface channelising movement, defined by its own two-dimensional edge on the horizontal plane. The path visually encompasses a spatial environment as defined by the positions of horizontal edges. (enclosing surfaces of buildings etc.)

The view from an unenclosed path will extend to the horizon, whereas the view from the path traversing the narrow space between buildings may extend to infinity in the forward and reciprocal directions, but will be stopped in the right and left directions by containing surfaces.

The path is the basic element of our study since by definition it controls the sequence of events exposed to the moving observer and it is the linkage structure between centres and districts.
ENVIRONMENT - Space Defining Elements

Edges: Edges are physical elements mainly two-dimensional, but visually significant from several standpoints:

(a) They may be seen as barriers to visual penetration.
(b) They can act as barriers to physical movement, e.g., a river bank or a motorway.
(c) They can be interpreted as space-defining elements in the form of vertical surfaces.

Seams: Seams are bands of transition which serve to separate two similar areas, or join two dissimilar areas. A river, while acting as an edge, can also act as a seam in the context of the two above examples.

ORIENTATION ELEMENTS.

All of the above elements are classifiable as orientational elements since they are physical realities on the ground. Where the characteristics are particularly marked and singular we can refer to an additional class of element, namely Landmarks.

Landmarks: A landmark is an element with a clearly defined structural form, has strong identity and meaning. Landmarks are external to an observer and are seen as objects in the landscape; church spires, water towers, radio masts etc., are frequently important landmarks. In largely undifferentiated landscapes, landmarks used in way-finding are more numerous and considerably more subtle, often defined in terms of associations, meaningful only to local inhabitants.

(ii) Visual/sensory qualities of Environmental Form

The urban pedestrian's environment is contained within the spatial envelop of paths and centres. The visual sensory experience of the
observer in motion is determined by the scale of surrounding buildings, the changing spatial pattern produced by the way and degree which enclosing structures are set back, and the height of structures. The variable qualities of light, colour, noise, floor texture and microclimate, also influence the nature of the visual/sensory experience of a sequential journey in pedestrian space.

The following is a list of the main variable qualities of environment which, in combination, produce characteristic experiences:

(a) **Spatial Qualities.** (relating to enclosing structures/surfaces)

   - Spatial Form.
   - Spatial Scale.
   - Spatial sequence-linkage.

(b) **Within the Spatial Environment.**

   - Light Intensity.
   - Colour.
   - Moist Intensity.
   - Texture of floor. (Textile quality)
   - Topography. (Vertical movement of path).
   - Microclimate.

(a) **Spatial Qualities**

**Spatial Form:** Spatial form is established by a combination of vertical and horizontal planes. The nature of the formed spaces may be sensed as plastic as in objects in space, (three-dimensional convex) spatial as in architectural space (three-dimensional concave) and pictorial as in simple surfaces. (two-dimensional planes)\(^2\). All three conditions are exposed in the pedestrian environment, although for the purpose of this study we shall confine our definition of form to the relationship of the
2-dimensional vertical surfaces or edges, which establish the basic pattern of pedestrian spaces. The pattern of spatial form can be manipulated in design by adjusting the positions of enclosing structures or by introducing new structural elements into a primary space.

**Spatial Scale:** Spatial scale is established through the (mathematical) relationship of horizontal and vertical planes. In urban space this relationship is established as a function of the distance between buildings and their heights. Various writers in urban design, including Blumenfeld, Maertens, and Camillo Sitte, have sought to demonstrate an optimal scale for urban spaces in the city. Maertens is concerned with the science of scale as an optical problem and relates scale perception directly to the mathematical constants of the human visual apparatus. Blumenfeld concerns himself with urban spatial scale and the speed of travel and further, the internal scale of the vehicle from which an observer experiences urban space. He also observes the goal conflict in producing an optimal scale for observers on foot, simultaneous with a scale for those in vehicles travelling at various speeds, but all moving essentially through the same spatial environment.

Most of the observations or theories are not developed sufficiently for us to establish some critical mathematical constants as yardsticks for evaluating and designing the scale of urban space.

As an approximate guide to evaluating scale the following definitions seem useful:

1. **Intimate Human Scale** - the limits within which conversation can occur between two persons.

2. **Normal Human Scale** - the distance at which one can identify an
acquaintance, 70 - 80 feet.

(3) Super Human Scale - the distance at which one can identify a human figure, 4,000 feet.

A further criterion for spatial scale is the angle at which an object can be perceived clearly - about 27°, corresponding to a ratio of 1:2 between the size of an object and its distance from a beholder. This provides an optimum relationship of 72 ft. horizontal dimension and 36 ft. vertical dimension.

**Spatial Linkage**: Linkage is the quality of inter-connectedness. The sense of spatial inter-connectedness is heightened through contrast in the sizes of juxtaposed spaces. When two urban spaces of similar sizes are separated by a third which is either very much larger or smaller, the sense of linkage occurs through a kind of dynamic tension.

Spatial linkage is of particular significance to the kinesthetic experience of the observer in motion. Contrast in the sizes and form of spaces creates a rhythmic pattern which impells movement and exploration through space. This factor can be exploited in the design process towards achieving the objectives for structure and diversity in the pedestrian environment.

(iii) **Kinesthetic Variables**.

The visual sequence experience of the observer in motion is a kinesthetic one and the most important variables influencing the nature and depth of this experience are the following:-

(a) Speed of movement.

(b) Direction of travel.

(c) Goal elements - successional landmarks.

(d) Rhythmic form - sequence of elements and spaces, points of
change or transition.

(e) Event/Activity sequence.

(f) Sequence quality structure.

(a) **Speed of movement:** This varies from the almost static non-goal oriented 'moseying' downtown to the purposeful goal-oriented journey of say the person moving from a transit stop to the office. Pre-occupation and the nature of the journey are likely to be far more significant in terms of the perceptual world than the actual speed of travel, although the two are clearly interrelated. In designing visual sequence experiences for the observer in motion, speed of travel should be evaluated in terms of the overall purpose of a given route. In general, in routes for fast goal-oriented walkers, there should be an expanding in scale of facilities and a lengthening of the rhythm of goal elements.

(b) **Direction of travel:** Significant, particularly for purposes of assessing reverse sequence experiences, obtaining a clear sense of direction - structuring the visual form of the route to enable distinction in reciprocal directions of travel. The use of clearly rooted successional landmarks with locational significance is a means of achieving directional orientation.

(c) **Goal elements:** The observer in motion will orient himself upon a series of goal elements along the route of travel. These will be approached, arrived at, then passed. The attainment of each goal element or landmark will signify a point of progression along the route, and will enable an observer to determine his position relative to the whole journey. The traditional system of milestones along early routes was in effect, a simple sequence structure of
14.

equidistant landmarks. The frequency and nature of goal elements along a route can be programmed in design and an important criterion in evaluating existing routes is the ability to maintain a constant sense of location and orientation throughout the journey.

(d) **Rhythmic form**: This refers to the sequential pattern of spaces and elements in space. A pattern of space is the build-up of units of space such as large, small, large, small and so on, or of elements in space which, through repetition, create a rhythmic pattern. Rhythm can be used as a means of stimulating movement through controlling the lengths and forms of space and the densities of recurring elements.

A number of recent researchers, notably Thiel, in urban design have become interested in the potential of controlled rhythmic sequences along paths as an approach to designing routes.

*Philip Thiel* 7 has devised a notation for designing the sequence experience along paths in the city modelled upon musical notation. This has exciting implications but is still untested in practice.

**Points of change or Transition**: We refer here to the changes in visual experience when moving from one definable area to the next. The change in experience can be abrupt or transitional, the contrast sudden and distinctive or a gradual merging of experience.

The change sequence can be structural to achieve determinable or staged experiences of contrast or transition programmed in accordance with the rhythmic pattern of events designed for a given route.

(e) **Event/Activity sequence**: Structuring of the activity sequence within pedestrian space (endogenous activities) and of the activities
adjoining a pedestrian path (exogenous activities) can be carried out much in the same way as structuring the rhythmic sequence form.

Exogenous activities adjoining a path are a function of land use. In the usual planning process, land use locations are never considered from the standpoint of the visual sequence experience from the adjoining path system.

Existing land uses can be exposed or made transparent revealing the processes of certain industrial activities. The pattern of land use can be manipulated to reveal given types of activity sequences. Location of new land uses can be planned relative to the total sequence activity experience. Exogenous land use activities, by their nature and type, can suggest themes for given sequences along the path system. For example, the "tailoring section", the "printing district", the "financial district", the "town house section", the "riverside section" etc.

Endogenous activities or activities oriented specifically upon pedestrian space, eg. recreational; can be structured in terms of type and location producing thereby an event/activity sequence experience by design.

The designed sequence-activity structure would be co-ordinated with the visual sequence, ensuring appropriate environments for given activities.

(f) **Sequence quality structure**: The qualities of Light

- Colour
- Moist
- Texture
- Topography
- Microclimate
also those of Age and Social groups can be manipulated to achieve
given combinations or a variety of environmental types along a given
path sequence.

Texture and topography refer to floor quality, which can have,
for example, the following combinations:

- rough/steep  smooth/steep
- rough/flat  muddy/flat
- hard/rough/flat

(iv) Perceiver Variables: The perceiver-environment relationship is a
two-way process dependent upon the external variables of environment which are:

- Chosen path
- Direction and rate of travel
- Field of vision

and the internal variables of perceivers:

- Age
- Preoccupations
- Culture/Value systems
- Familiarity level

While it is known that certain extreme environmental conditions can
reduce perceiver differences to a common level, we are catering for the
most part for a wide range of visual/sensory perceptive interpretations.
Value systems vary from group to group and the level of quality inter-
pretations covaries with these value differences. A 'clean' environment
may be the goal of one group but unimportant in the range of priorities
of another.
A certain historic building may have intrinsic value to many, but for some it might be "ugly" and others a "waste of good building land". The challenge of urban design is to meet those conflicting values through compromise and intelligent alternatives, to tap the feelings of the citizens for whom the plans are inevitably intended and to demonstrate the field of opportunity latent in their environment.
2. OBJECTIVES FOR VISUAL FORM DESIGN

In the preceding section we sought to reduce the problem of the visual component of the pedestrian environment and of the pedestrian sequence experience to a number of basic elements which we shall later seek to control in the design process. These elements provide us with the framework for field survey and data gathering. They provide a further basis for the evaluative process through which we can measure the performance of components and by this, determine the problems and opportunities which exist in environment subjected to survey.

A prefatory aim is to decide upon the kinds of pedestrian experience we want to create and to provide the guiding principles through which we can achieve what we want. Any given environment subjected to evaluation in terms of posed criteria will exist as a departure, only so far as it fails to satisfy these criteria. This is an over-simplification of a problem which does not, in fact, lend itself to such straight-forward resolution since the kinds of criteria we apply are frequently subjective, and to an extent, intangible and lacking in any truly quantifiable characteristics. The method is justified, however, since it does discipline the overall approach to the design problem and provides a critical faculty through which judgments can be made. Furthermore it provides the means for extending the number of variables for consideration in the design process.

In the light of the above the following goals are formulated as the overall guiding principles for designing the perceptual environment of the pedestrian:

(i) Structure (Legibility)

Develop a strongly coherent visual image structure with clearly
defined spaces, visible goals and legible entrances. Create visual continuity with adjourning areas of the city and a strong sense of connectedness along the path emphasising linkage and progression in the sequential experience from centre to centre, event to event.

(ii) Identity (Legibility)

Provide the pedestrian with a strong visual image of the environment, clarifying the identity of each centre and section along the path. Make the pedestrian's journey a memorable one. Enable him to orient himself frequently along the path and to identify and re-identify the main features of the city within the visual scope of the path.

(iii) Meaning

Expose the functions and nature of activities which adjoin the path, make the urban processes transparent so that they can be understood by the passer-by. Deepen the sense and significance of history, exposing not only historical structures, but the functional orders associated with them, thereby making history meaningful and dynamic to an observer as he moves through the environment. In general, this goal is promoted to expose the symbolic role of the city, to expose natural sites, institutions etc.

(iv) Diversity.

Create a sequentially diverse range of visual/sensory experiences for the observer in motion. These can be structured in such a way to achieve a progression of openness or enclosure, restrictedness or freedom, loudness or quiet, a sense of danger, challenge or security, a sense of tension, a sense of repose, or say contact with nature or with urban process.

Diversity along a path will promote the level of choice for the
observer in motion and enable him to ponder, interact, participate or withdraw as he desires.

(v) **Comfort**

Provide an equable level of visual/sensory comfort for the pedestrian. Relating this level to the nature of environmental function, i.e. achieve a level of comfort congruent with the nature of the activity environment. In general, the environment should neither be too noisy, too bright, too hot, too cold, too dirty, too clean etc. The pedestrian experience should be safe and stress free, his perception channels should not be overloaded by a confusing plethora of signs, symbols, noises and choices.

The levels of agreed comfort vary among different social/cultural groups. In the case study area, to which the objectives will be applied, the levels of comfort will have to be compromised since we are dealing with both a resident population and a large visiting public. The residents will find it particularly hard to sympathise with some of the actions which will be taken to preserve historic spaces and structures and to develop facilities oriental mainly upon non-residents.
3. SPECIFIC DESIGN CRITERIA.

From the generalised level of these foregoing principles, more detailed interpretations as to specific standards for given aspects of the pedestrian perceptual environment are required. Criteria are developed, therefore with specific application to the components of environmental form, namely DISTRICTS, CENTRES and PATHS. These criteria emerge from the five basic design objectives. They will be applied to selected centres and paths in the Charlestown Case Study Area. The criteria are posed in the form of questions since these imply standards of performance without necessarily prescribing them in the form of specific actions.

(i) Criteria for DISTRICTS and CENTRES

**Structure**

1. Are the Districts and Centres clearly structured and differentiated?

2. Are the Centres and Districts clearly connected? Is it possible to accurately locate all the Centres?

3. Are the entrances to Centres and Districts clearly marked, legible and related?

**Identity**

4. Do the main Centres of the study area have strong individual identity and visual character?

5. Are the Centres clearly rooted and expressive of the area in which they lie?

**Meaning**

6. Are the Centres expressive of their individual functions, their historic and social structure? Do they convey clearly their available facilities?

7. Do the signs and symbols marking facilities and services read clearly?
8. Are all the signs and symbols in the centres rooted there?

**Diversity**

9. Do the Districts and Centres offer a range of environmental choice?

10. Are the available choices in the Centres clearly structured and accessible?

**Comfort**

11. Does the scale of spaces in the Centres feel comfortable?

12. Do the Centres feel comfortable and safe? Are the sensations of noise stress, fumes within the comfort range?

13. Are the sensations of light and microclimate within the comfort range?

14. Is there adequate provision for shelter and rest? Are the facilities accessible?

(ii) **Criteria for Paths**

**Structure**

1. Is there a coherently expressed spatial structure surrounding each path?

2. Is there a strong sense of visual continuity along each path?

3. Are the visual connections from the path clearly developed both laterally from the path and along the axis of the path?

4. Are the junctions or intersections of adjoining or lateral paths coherent? Are the entrances clearly structured?

**Identity**

5. Is there a clear sense of location and direction along the path?
6. Are the reciprocal directions easily distinguishable from each other?

7. Are the environments traversed by the path clearly identifiable?

**Meaning**

8. Is the functional character of the area traversed by the path meaningful? Does it convey urban processes and activity?

9. Is the social/economic structure of the area clearly communicated?

10. Does the path reveal a sense of the history of the area or of its likely future trends?

**Diversity**

11. Is there a diverse range of sequential experiences available along the path?

12. Is the sequence experience dull and boring, or is it challenging?

13. Is there a choice of environments along the path?

**Comfort**

14. Does the path environment feel comfortable? Does it convey sensations of stress or tension?

15. Is the scale of the spatial environment and the objects in space harmoniously related to the human scale? Is the scale comfortable?

16. Is the surface of the path comfortable to walk on? Does it feel too rough, too smooth, too hilly, too flat, or is it uneven and broken?

(iii) Criteria for the sequence experience

**Structure - Districts, Centres and Paths**

**Structure**

1. Are the visual/spatial linkages between main paths and
centres clearly structured?

2. Are the entrances to each path and centre clearly differentiated?

3. Is there a recurrent sighting and approach to visual goals?

4. Does the observer have a sense of forward progression, and is there a meaningful and vivid succession of events?

5. Is there a well-structured rhythm of contrasting spaces and elements in space?

**Identity**

6. Are the events and activities unfolded in a clear and rational sequence?

7. Is there a progression of environments with a coherently expressed and individual identity?

8. Is there a clear sense of location and direction along the sequence traverse?

9. Are the event sequences memorable? Are adjoining landmarks clearly exposed, and do they correlate and signify a change in the sequence of events?

10. Can an observer in motion sense the continuity of the path ahead of him, or is he presented with confusing breaks or other uncertainties?

**Meaning**

11. Is the observer presented with a meaningful sequence of events? Does the view from the path expose the main elements of the area, the activities, and institutions in a clearly identifiable way, and does it indicate how they can be reached?
12. Is the significant history and the predictable future of the area being traversed visible to the observer? Is the natural setting, social characteristic, and basic functional order comprehensible from the main path system?
URBAN DESIGN PROCESS SURVEY ANALYSIS EVALUATION DESIGN IMPLEMENTATION

**OBJECTIVES**

- Aims, scope and focus of Exercise

**FORM COMPONENTS**

- Specific elements of survey.

**VISUAL-SENSORY QUALITIES**

- Specific qualities of perceptual environment.

**DATA ANALYSIS AND EVALUATION**

- Application of specific criteria.

**PROBLEMS AND OPPORTUNITY AREA**

- Manifest problems and opportunities constraints-scope-assumptions.

**FORM SYNTHESIS**

- Evolution of form Development of proposals.

**DESIGN PROPOSALS**

- Sketch Designs
  - Alternative solutions

**IMPLEMENTATION**

- Feasibility implications strategies priorities

**DEVELOPMENT PLAN**

- Staged Area Development
- Staged Acquisition of Land and Property
- Staged Capital Development Costs
- Staged Site Plans

**REVIEW REVISION**

- Feed Back
Components of Environmental Form

Fig. 2.
LEGEND:

FLOOR TEXTURE
ROUGH SMOOTH HARD SOFT

TOPOGRAPHY
VERTICAL STEEP MOD. STEEP FLAT DEPRESSED

SUDDEN LOUD NOISE CONTINUOUS NOISE
LIGHT BRIGHT DARK

APPEARANT ACTIVITY HIGH LOW

FLOOR QUALITY SEQUENCE
TOPOGRAHY TEXTURE

SPATIAL ENVIRONMENT
FORM SCALE LINKAGE

PERCEIVED SEQUENCE
QUALITY EXPERIENCE
LIGHT NOISE MICROCLIMATE

VISUAL / SENSORY QUALITY

FIG. 3.
SEQUENCE - EXPERIENCE
VISUAL/SPATIAL STRUCTURE

ORIENTATION STRUCTURE

EVENT FREQUENCY STRUCTURE

KINESTHETIC STRUCTURE

FIG. 4
III. CASE STUDY

1. PURPOSE AND SCOPE OF THE STUDY

The purposes of this case study are the following:

(i) To apply the framework for perceptual analysis and evaluation to a section of the city to reveal problems and opportunities of the pedestrian's perceptual environment.

(ii) To make design proposals for the visual component of the study area pedestrian environment which will develop the identified potential and alleviate exposed problems.

(iii) To test the feasibility and implications of the design proposals, and to suggest strategies through which they can be made implementable.
2. SELECTION OF THE STUDY AREA

The main criteria which were used in defining an area suitable to demonstrate and test the principles of this study are as follows:-

(a) **Density.** Area had to be from moderate to high density with concentrated activities enabling a high potential for pedestrian trips.

(b) **Boundaries.** Limits of the area had to be fairly well expressed so that the level of interaction or linkage with adjoining areas could be easily understood.

(c) **Size.** The size of area - confined to reasonable walking distance from the centre to the boundaries. (1\(\frac{1}{2}\) - 2 miles max. radius).

(d) **Diversity.** The area had to support a wide range of activities and environments - fine grained as opposed to coarse grained.

(e) **Historic.** The area had to have a reasonable level of historical association.

(f) **Potential.** A high degree of unrealized potential had to be evidenced in the area so as to illustrate detailing the approach taken.

Charlestown, Massachusetts, apart from being conveniently at hand, met the requirements as indicated by these criteria and was further desirable on account of the proposals for redevelopment which have not been implemented yet. This provided a level of reality to the study in that proposals for the path system either complimented or suggested modifications to The Redevelopment Authority's plans. This latter question will be dealt with under the section on Implementation.

The study will concentrate specifically upon the section of the town centering on Town and Bunker Hills, where the opportunity seems greatest, the problem severist and where it will be possible to
illuminate most clearly the principles developed for analysis and evaluation. The extent and physical character of the study area is shown on figure No. 9, page No.
3. DESCRIPTION OF AREA

(i) Physiographic

Originally an island apart from a narrow neck of land linking it with the mainland, Charlestown has remained since its initial settlement in 1629, relatively isolated from neighbouring downtown Boston and Cambridge. It has maintained a powerful discreteness of boundary and most of the principal routes of access are over bridges.

The site of the town is topographically impressive, with the central ridge of a linear drumlin formation running down the long axis of the peninsula from west to east. The major orientations of the town, therefore, are to the north and south with views over the Mystic River and the Charles River respectively. The eastern end of the peninsula fronts on the Boston Harbour.

There are three principal hills or high points along the ridge, these are Breeds Hill, the highest point, Bunker Hill where the monument is sited and Town Hill which is the lesser of the hills and lies to the south of the main axis with orientation south and east.

(ii) Historical

Initial settlement of the area and founding of the town occurred in 1629, preceding that of Boston proper by one year. The town had 2 - 3,000 inhabitants in 1775 when it was destroyed by fire following the Battle of Bunker Hill on June 17th, 1775. The present town was built upon the foundations and street pattern of the earlier one and was almost fully re-established in 1795. The majority of building which constitutes Charlestown of the present was constructed between 1780 and 1850. Very little building other than extensions to the Navy Yard, the construction of the elevated MBTA Line sixty years ago and the Mystic
River Bridge has occurred during this century. A sizable public housing project was constructed approximately twenty years ago.

The successive stages in the early rebuilding of the town are clearly evidenced in a series of architectural styles all of which have chronological significance in terms of national waves of fashion in building. In chronological order these are:

- Pre-Federal
- Greek Revival
- Italianate
- Gothic Revival
- Queen Anne
- Romanesque
- Georgian Revival

The figure No. 10 opposite, indicates the areas of concentration of each of the various styles and provides, therefore, a clear notion as to what was built where and when. While the basic structure and the architecture of Charlestown changed little over the past hundred years, the social structure and level of diversity in the town's economic base has altered enormously. From a town of considerable mix in life and income styles, in religion and occupation, Charlestown has become increasingly more homogeneous and markedly less diverse. Competition from other ports within the region has dwindled its previously enjoyed status as a shipping centre. The merchant class hitherto tied to Charlestown for business purposes moved on a hundred years ago, and the town lost its two hundred and forty-five years of status as a township and later a city, to Boston in 1874. This had further implications in regard to dwindling incentives for the local upper class leadership to remain in Charlestown, their
Incorporation with Boston was the final blow to the role of Charlestown as a well-balanced independent self-determining community. While the overall forces of social and economic change are similar to those of other towns of the same period, there are several unique historical characteristics which make Charlestown a particularly interesting case study. These are enumerated as follows:

1. Initial focus of settlement in the Boston area.
4. 1st U.S. Navy Yard established 1800.
5. Once active, now dwindled Port.
6. Clearly identified periods of architectural style.
7. Mix of existing housing type and size indicating one time diversity of social economic groups (living in close proximity).
8. Mixed fine-grained industrial base indicated by now vacated structures at points throughout the town.
9. Harvard Medical School began in Charlestown.
11. Homogeneity and stability of present population established in Charlestown since the 1850's.
12. Clarity with which problems and assets of the town make their impression. Viz. elevated M.B.T.A. Line, Mystic River Bridge and the N.E. Expressway; complete lack of visual contact with a water edge which surrounds the town on three sides.
4. VISUAL SURVEY METHOD

A visual survey of the study area was undertaken in the field embodying three levels of reconnaissance:

(i) An aerial reconnaissance.

(ii) Major paths and boundary reconnaissance.

(iii) Detailed pedestrian sequence traverses along main paths and centres.

The aim was to become initially familiar with the total structure of the area then to focus down with increasing scrutiny upon the internal structure of paths and centres.

(i) The Aerial Reconnaissance

The initial visual survey of the area was directed at achieving a sense of the visual structure of the entire study area, relative to that of the surrounding urban area. This was achieved by observations made from the top of the Bunker Hill monument, some 300 feet above the lowest point within the area which is sea level. (figure 6 and 7 refer) From this vantage point it was also possible to determine the internal organisation of streets and centres and to make assumptions in regard to main activity loci and the principal paths.

(ii) Major Path Reconnaissance

Having established through the aerial survey, the generalised visual and functional structure of the area, a visual reconnaissance was carried out along principal paths, taking in main centres. The principal paths of the area were also traversed. The paths were surveyed in both directions, and all principal landmarks, activity points, and other visual elements were mapped. The survey formed the basis for completing an overall visual structure diagram, see figure 8.
(iii) Pedestrian Sequence Traverses

A number of the main paths were selected for more specific study on foot. These were traversed in both directions, all significant elements and qualities exposed along the routes were mapped. The principal centres were also studied, examined from all approaches.

Sequence photographs by 35 mm. camera as 'stills' were taken at points along the routes and of the centres. Those sequence photographs are shown in figures 14 to 23 inclusive.

The framework for survey and analysis developed for elements and qualities basic to the visual form and sequence experience forward the basis of data collection in the detailed survey, see figures 2, 3, 4, and 5.
5. FINDINGS OF THE VISUAL SURVEY

(i) Existing Visual Form. See figure 8.

In general the visual structure of Charlestown is dominated by:

1. Land form and building structure upon it.
2. Surrounding water.
3. The bridges and elevated highway and transit lines which link up or pass through the area from downtown Boston to the north.

The imaged structure of the town varies considerably from area to area although four major experiences are dominant:

1. The view of the town from the outside - a large rounded built-up hill.
2. The image of the town from the southern flanks of Breeds Hill.
3. The image of the town from the northern flanks of Breeds Hill.
4. The image from the Town Hill.

Taking a generalised external look at the town, several elements of its visual form are strikingly dominant, these are:

Paths

1. The Mystic River Bridge and the N.E. Expressway (also a landmark).
2. The elevated M.B.T.A. Line (seen from south only).

Edges

3. The elevated edge of building forms along Breeds Hill.
4. The edges of the Mystic and Charles Rivers, and the Boston Harbour.
5. The railroad yards on the southern boundary.
Districts
7. Rutherford Avenue (a lineal district).
8. Industrial complex on the banks of the Mystic.
9. The public housing project.
10. Town Hill.

Centres
11. City Square.
13. Hayes Square.

Landmarks
16. Francis de Sales Church.
17. Breeds Hill.

From within the town, external landmarks include:-

Views South
1. Customs building.
2. State Services building.
3. Massachusetts General Hospital.
4. Beacon Hill.
5. John Hancock building.
7. And the Boston downtown skyline generally.

Views North
Chelsea Hospital complex.
Boston Edison Steam plant.
Middlesex Fells.
Schafts Factory.

Views West

M.I.T. Earth Sciences Building.

The visual form of Charlestown on a macro-level is well structured and easy to comprehend particularly from the north and south. The image from the west, however, is somewhat incomplete, obscured by a confusing mix of building form and roads. The Boston Navy Yard and the North East Expressway cut-off views into the town from the east and no clear image is possible, therefore, of its visual character. The detailed visual structure as imaged within the area is analysed in greater depth on the existing visual structure, figure No. 8.

Pedestrian Environment.

Close-knit building of the town which was developed in sympathy with existing landform has given rise to an intricate street pattern of exceedingly fine grain. The pedestrian path system adjoins the vehicular network throughout the town although there is a minor system of back alleys and lanes which are segregated. Some of these are developed expressly for pedestrian movement and are maintained by the municipality. The majority are merely service alleys leading to the backs of private properties and in this sense are restricted for the use of local residents.

The footpath system of the town while fairly well developed originally, has declined markedly both functionally and visually.

Major changes in the physical structure of the town have not been accompanied by alterations to the local path system and the level of visual and physical access has been reduced considerably, therefore, through environmental change, viz. installation of the elevated M.B.T.A.
Line sixty years ago; devastating effect of the N.E. Expressway and the Mystic River Bridge, more recent intrusions upon the physical structure of the town.

The pleasant spatial scale, interesting architectural style of the buildings and the relationship of these to the topography has given Charlestown the basis of a diverse and legible visual form.

The aim of this study is to reveal the former visual quality of the area and to express the significance of its historical development to be experienced in pedestrian space. The design process will seek to unite historic urban form with present and projected future functional requirements and so expose the dynamic aspects of environmental change.

Existing visual structure, environmental quality etc. of pedestrian space are shown on maps Nos. (ii) Visual Sequence Structure - Specific Centres and Paths

Reference to photographic analysis figures 14 - 23 inclusive.
The Mall as seen from City Square.

Approach to Mall

Sea of Clutter occupies potential environmental space

Back Alleys around City Square

CITY SQUARE

Dangerous walking space
A relic to former independence

View into Thompson Square Parking Lot

One of the oldest standing buildings in Charlestown
The General Store of Thompson

The 'Elevated' can have positive factors

THOMPSON SQUARE

Street space filling up with cars

Rutherford Ave School scheduled for demolition closed space effectively
Charlestown High School

Monument Street from the south

Monument from the east

View down to Winthrop Square

Monument Street down to the Mystic Channel

View north east - Mystic Br.

MONUMENT SQUARE
Statue of Col. William Prescott
View up the Monument Square

Typical back alley leading to the square

The square is always in active use by local residents.

House of Winthrop restored and in good condition.

The powerful linkage between Winthrop and Monument squares is worth noting.

Exit or Welcome
The above shots illustrate the environmental character around the Constitution -- inaccessible, inhospitable to the pedestrian.

Tunnel for pedestrians feels like a gun emplacement.

Sailors pub opposite the entrance to the Constitution.

Buses and cars obstruct the space around the ship -- obviously the site is inadequate for this popular tourist attraction.

Pedestrians and cars use the same entrance.

Main approach to the Constitution.

Best view of the Constitution is from within the private compound of Hoosac Pier.

Land in foreground is vacant -- suggested new site for the Constitution.
NORTH END TO CITY SQ.

Receiving place
-major node
where to now?

Multi-directional
traffic circulate
around Square-
the pedestrian is
bewildered

The first confronta-
tion with confus-
ion

View left showing
the piers of the
original Warren St.
Bridge.

This angled sheet
metal guard is a
disturbing element
obstructs access to
the bridge railing
and visual contact
with the harbour
below

When MBTA line is
removed will the
spatial scale of
the bridge be over-
powering - uncom-
fortable? There are
means of countering
this problem

Entry to the Bridge
Charlestown bound

Reciprocal view
The North End is
ahead
The Constitution is suddenly unveiled.

From the standpoint of location, the nature of the site, and the adjoining land use, the Constitution should be removed to a more accessible and open location. Further, it is important to establish historic continuity between the 'element' and its surrounds.

There is no compelling urge to walk this street.
Where is the Constitution?

Barren pavements, chainlink fencing, billboards and derelict autos sum up the walk to the Constitution from City Square.

Prior to the construction of the NE expressway the Constitution was more integrated with its surrounds.

View ahead is over the site proposed by this study for the relocation of the Constitution. North End is on the far side.

Take a right.

note sign for the Constitution.
CITY SQ. TO MONUMENT SQ.

Monument becomes fully visible

Approach to Monument Square

Gateway formed by Memorial Tablets

In the heart of the Square

Strong sense of entry

Space established by continuous facades of bldgs.

Approach - trees define spatial form from the distance

Confused sense of space - ubiquitous cars, overhead MTA line etc.

Charlestown Bridge

City Square

MTA Stn.
City Square, the 'Y' on left, Police stn on right

City Square

Entrance to City Sq.

Breaks in spatial form of continuity along the path - loss of theme or organising quality

Ramp on and off the N.E. Expressway form a physical hazard to walkers using Park St.

Winthrop House, one of the original houses

Primary enclosure by buildings around the square create a 'human' scale, screened 2ndry enclosure formed by trees creates an 'intimate' human scale

Open markets congregate here on Saturdays

Winthrop Street

Town houses of the former wealthy citizens of the Town

Sense of entry is very strong here - containing surfaces of buildings the slope down, and the vertical memorial tablets contribute to this

Monument Square

Bunker Hill Monument
Reciprocal view to Monument Square

Street is barren

Derelict building obstructs axial vista to the Mystic Channel from Monument Square

Public Housing Project

View down to the Mystic

Summit of Bunker Hill – entrance to the Monument

Statue of William Prescott

Detail of the obelisk from the north

Monument Street – the main approach to Bunker Hill on foot
6. EVALUATION - APPLICATION OF CRITERIA

The application of criteria developed from the design objectives for STRUCTURE, IDENTITY, MEANING, DIVERSITY, and COMFORT detailed in the SECTION II under METHODOLOGY, was systematically carried out throughout the entire study area. The results of this evaluation are shown on figures 24 to 28, which graphically locate and symbolise the problem and opportunities. This exercise was applied specifically to the main components of the visual structure, namely Districts and Centres and Paths and to the sequence experience structure embodying paths and centres.

The findings of the evaluative process are summarised as follows:

(i) Districts and Centres - Criteria 1-14.

More than 2/3rds of the study area is ambiguous and lacking in a sense of structure. Three sections dominate the overall visual structure. These are Bunker Hill District due to its topography, the tightly-knit Town Hill area, which again has some topographical clarity, and the coarse-grained area of the public housing project which has a stark-like clarity. Problems of centres, include ambiguous structure, poor interconnections with adjoining areas, confusing and dangerous entrances, lack of congruence with adjoining development as in the case of the USS Constitution. Problems of meaning are common, in that centres fail to express their historic and present functional roles. Some parts of the study area provide a cogent image of these characteristics. Bunker Hill is monumental, visually well-structured and clearly marks an important site. City Square at the other extreme fails to communicate anything
other than an environment which has been incrementally adjusted from time to time to meet new functional demands, the new being superimposed upon the old and the present bearing little relationship to the original functional order, or indeed the present. The sense of history is revealed strongly in some sections by the character of the buildings and the nature of the streets - but these are discontinuous. For the most part the environment is too mixed to express any strong individual functional characteristics. Facilities are poorly advertised and frequently under-provided in terms of shelter and rest. Perceptual over-load, caused mainly by non-rooted signs and symbols is particularly a problem in City Square. Lack of environmental choice is common to all of the study area. Scale of spaces and of objects in space is particularly a problem in City and Thompson Squares and at the USS Constitution due to the overwhelming structures of the elevated M.B.T.A. line and the North East Expressway. The level of comfort is a particularly serious problem. Free unobstructed pedestrian movement is not possible over much of the area. Access to major centres is by devious routes made hazardous by dangerous traffic intersections. The surfaces under foot are irregular and discontinuous. Noise, drafts, dirt and darkness are common problems throughout those parts of the study area, which adjoin the elevated M.B.T.A. line and the North East Expressway. The proposed removal of the elevated M.B.T.A. line will immediately alleviate much of the problems of microclimate and improve the environment of City and Thompson Squares.

(ii) Problems of Surveyed Paths

Many of the problems, listed for centres, are common to the paths
in the studied section. There is a lack of structural unity and
generally legibility, spatial and linear connectedness are frequently
lacking and one is confused by the overall similarity of routes, partic-
icularly those emerging from City Square. There is a lack of hierarchical
definition in that principal or the most direct linkage paths are not
differentiated either by size or form from minor paths. Orientation is
frequently difficult and there is a general lack of a sense of location.
There is the further problem of ambiguous structure along the path, no
clear sense of the functions and processes which are being carried out
in the areas traversed. The historical significance of Charlestown is
not communicated by the path system and often important historic elements
are hidden behind an amorphous and meaningless sprawl of buildings and
clutter. There is a lack of explicitly announced environmental choices;
malls and parks, like the Harvard Mall, exist in isolation and are not
visually integral with their surrounds.

Environmental scale as noted under the examination of centres is a
frequent problem due to the elevated N.E. Expressway and M.B.T.A. line.
What could be a dynamic and pleasant pedestrian link from the historic
North End of Boston, the Charlestown Bridge, is dirty, draughty and
noisy. It is not possible to view the harbour from this bridge without
leaning over the handrail. Even this is difficult due to a continuous
pipe line cover which protrudes from the handrail the entire length of
the bridge.

(iii) Problems of the sequential Experience

These problems are viewed in the light of the total perceptual
sequence experience along the principal routes from centre to centre.
Take, for example, the trip from North End to the USS Constitution,
Then from there to Bunker Hill. What are the problems experienced on such a goal-oriented trip? Starting at North End and making for City Square via the Charlestown Bridge .... Entry to the bridge is over a busy traffic intersection. At this point there is no clear notion that this is one of the most important physical linkages to Charlestown.

City Square, at the far end of the bridge, is a heterogeneous low mass with no perceptual drawing power. When approximately half way along the bridge on the left path the major landmarks of Frances de Sales Church and the Bunker Hill Monument become apparent. Also significant is the built-up form of Breed's Hill, a prominent topographical landmark. The entry to City Square is announced by overhead intersections of the N.E. Expressway and the M.B.T.A. Line. On the ground, traffic converges from five intersecting streets. Forward progression halts, confusion is experienced - noise, movement, dirt, darkness. Spatial clutter, a heterogeneity of directional signs and advertisements, mostly directed at the overhead Expressway traffic, and meaningless in terms of the pedestrians in the City Square. Where to next and how? None of the paths leading from City Square have directional significance or an imageable progression of landmarks which might give some directional clues. Within the square, a small sign points out the principal route to the USS Constitution. Taking a short minor street which takes a double right-angled turn under the cavernous draughty structure of the overhead N.E. Expressway, the pedestrian is then led on to Water Street, the main path to the Constitution.

This street carries a high traffic density - from out of the main egress ramps from the Expressway. Still no sight of the Constitution or clue to its whereabouts. Typical water front development of warehouses
and vacant lots line the right-hand edge of the route. On the left, chainlink fencing enclosing the 'dead' space under the Expressway, edges the path.

Approximately 400 yards are covered prior to arriving at our destination. A few tourist buses and some pedestrian activity finally announce the location of the USS Constitution. The Constitution is berthed in a built-up compound completely segregated and isolated from the centre of Charlestown. Visually the qualities of this magnificently proportioned 5-masted frigate are eclipsed by this inappropriate environment which is both visually and physically inaccessible, although 500,000 visitors per annum make pilgrimages to it.

Bunker Hill - where? The top section of this 300 ft. high monument is visible from the Constitution, but where is its base and how can it be reached? There is no direct linkage to Bunker Hill from the Constitution, nor any sign to indicate how it might be reached. In terms of historic meaning, both the Constitution and Bunker Hill share a common heritage, that of American Independence, this factor is not manifested in terms of physical planning.

The stubborn pedestrian explorer with a strong sense of direction will locate an obscure pedestrian link under the N.E. Expressway which leads via a number of short devious side streets to Winthrop Square. From this point Bunker Hill becomes a reality. The Winthrop Monument Square linkage is strongly expressed and the forward progression to Bunker Hill is marked by a succession of clearly expressed landmarks such as the two vertical World War 1 memorial slabs edging the main diagonal pedestrian path through Winthrop Square on direct access with the Bunker Hill Monument.
The principal problems of the sequence pedestrian experience structure of the studied section are summarized in figure 26. In the foregoing descriptive record of this writer's experience of the route taken between four main centres, the problems experienced range from visual ambiguity and confusion, poorly developed linkages, no sense of destination, no view of landmarks, no visual contact with surroundings, such as the water edge of the Boston Harbour. There are also problems of stress through conflicts with vehicular traffic, frequent dirt, fumes, darkness and microclimate. Serious perceptual overload occurs in City Square, the principal entry and distribution centre in the study area where all traffic and pedestrians converge.

(iv) Some visual opportunities in the Study Area

Figure 27 graphically symbolises visual and related opportunities. These are, to a large extent, synonymous with identified problem, having been evaluated in terms of the same design objectives and criteria. The opportunities are, therefore, exposed in terms of increasing legibility of centres and paths through clarifying structure, identity and meaning, increasing and diversity of experiences and raising the level of comfort.

Major visual opportunities through which action priorities will be established are summarised as follows:-

**STRUCTURE** - Strengthen and clarify spatial structure of paths and centres. Achieve this by building up gap sites, removing dilapidated and obsolete structures and elements. Extend visual linkages by removing visual obstructions, planting belts of trees and generally directing field of attention towards route goals. The aim is to reduce visual diffusion and achieve a higher level of visual homogeneity.
along the routes of travel without compromising the objective for raising the level of diversity of visual experience.

**IDENTITY**

- Strengthen entrances to centres. Achieve this by clarifying the functional structure and identity of each centre, increase the spatial scale, change surface textures and concentrate the build up of activities, thereby intensifying the contrast of the centre and the approach routes.

- Expose and clarify Existing Landmarks and create new landmarks. Identify a functional theme for each centre so that each centre has individual character.

**MEANING**

- Relate structural forms to activities, expressing functions so that they are meaningful. Reveal natural, functional and historical processes of the environment.

**DIVERSITY**

- Clarify existing environmental choice.

- Create new experiences along the paths and in centres by exposing views hitherto blocked off; by injecting new facilities such as exhibition areas, urban parks, new commercial centres etc.

**COMFORT**

- Improve walking surfaces and continuity of paths by co-ordinating paving materials, points of intersections, bridge over busy traffic crossings.

- Improve lighting system, lighting up dark areas.

- Reduce spatial/sign clutter by co-ordinating sign system, providing a clear hierarchy of symbols for different systems and speeds of traffic.
- Provide facilities for shelter and rest.
- Reduce traffic flow by diverting all non-local traffic.

The specific areas to which these opportunities apply are shown on figure 27, further supplemented by visual problems, figures 24, 25 and 26. These provide only a selection of the major problems and opportunities in the study area - there are clearly many more which will be exposed in the actual process of design.
PROBLEMS OF DISTRICTS & CENTERS

- Areas of high noise and dumb level
- Visual districts with internal orientation problems
- Areas of confusing visual entry
- No clear sense of destination
- Lack of visual and physical connectedness
- Area of perceptual overload
- Lack of visual and thematic organization
Problems of Paths

- Lack of Environmental Signs
- Lack of Visual Connectedness
- Confused Landmarks
- No Sense of Direction
- Compelling Entrances
EXISTING DECISION
POORLY STRUCTURED
EXISTING LANDMARKS
NOT CLEARLY
PROM IMPORTANT
POINTS OR FROM
PATH END
EXISTING HILL
NOT SEEN
NO CLEAR
ROUTE
NO DESC OF A
MAJOR VISUAL
ELEMENT
NO CLEAR
SENSE OF
DIRECTION
CONFUSING
PEAK PATH
DISTRESS
ENVIRONMENT

PHYSICAL CONFLICT IS AVOIDABLE
LACK OF VISUAL
DISTRACTION
LACK OF
DEFINITION & AMBIGUITY
NO CLEAR
SEEN
OF DESTINATION
EXISTING HILL
NOT SEEN
PATH ENVIROMENT
PROPOSALS FOR THE VISUAL FORM OF THE PEDESTRIAN ENVIRONMENT IN THE CHARLESTOWN STUDY AREA.

(i) Scope of Proposals

The proposals relate primarily to existing centres and major paths and to the establishment of three new centres. The scope of these proposals is illustrated in figures 29 and 30. The more detailed aspects of the nature and how these proposals will be achieved is dealt with later in this section.

The overall aims within the framework of already specified objectives, which the proposals are intended to give effect to are the following:

1. Optimise the study area for the pedestrian's perceptual experience.
2. Develop the potential of Charlestown's historic heritage in terms of the pedestrian experience.
3. Integrate existing historic centres and artifacts into the visual and functional structure of Charlestown.
4. Extend the Freedom Trail from North End to Charlestown by developing a strong physical and visual link between North End and City Square.
5. Provide a strong visual framework within which a strong inter-relationship occurs between individual centres.
6. Expose surrounding water edges and clarify the close physical relationship with the Boston Harbour in visual terms.

(ii) For whom are the Proposals intended?

The proposals are formulated to optimize the visual form of the study area for pedestrians. The latter belong to two major groups: (a) local residents within the area and (b) visitors to the area.

There are approximately 7,000 local residents and a total of 17,400 in
Charlestown as a whole. The tightly-knit environment of the Town tends to favour walking as opposed to driving which is slow and tedious along the narrow congested streets.

In terms of the second group of pedestrians, these are visitors mainly on excursions to the USS Constitution and to a lesser extent the Bunker Hill Monument. In 1965, half a million people visited the Constitution and 250,000 were recorded for Bunker Hill. The USS Constitution is, by far, the most significant of all historic sites within the Boston Metropolitan Area. The majority of visitors arrive to the Constitution by coach or automobile. Approximately a quarter of the Constitution visitors also take in Bunker Hill.

We have, therefore, two different sets of demand to meet in terms of developing the visual form of the pedestrian environment in Charlestown: those of a small resident population, who diffuse through the environment in patterns according to their personal goal structures. We also have the goal-oriented visitor who travels along only principal routes, seeking out, in the main, two highly significant historic centres. We have seen from the summary drawings of problems and opportunities, figures 24-28, that both Bunker Hill and especially the USS Constitution are unrelated to the rest of the Town and exist as isolated entities within an amorphous urban scene.

It has also been observed that Charlestown, apart from these two historic sites, has many other historic artifacts including a number of pre-federal homes, America's first Navy Yard, and the birthplace of John Harvard. See list on page 30 and figure 10, historic structure. Almost all of these are visually unexposed, but without question a strong and over-riding historic theme is sensed in the study area.
From the standpoint of optimizing conditions for the visitor who, in terms of sheer numbers, takes priority in our considerations, bearing in mind of course, that whatever proposals we do make for Charlestown will have considerable pay-offs for local residents in providing a much higher level of facilities than a resident community of this size could normally justify, and further, the opportunity for local residents to develop specific commercial facilities, oriented upon visitors, the proposals to develop the visual form of Charlestown to optimize its historic sites and to develop the emphasis of the circulation system for the pedestrian visitor seems a highly justified aim.

In purely visual terms, basing the emphasis upon historic centres, paths and landmarks will achieve a visual and functional order upon which local residents can become identified and oriented, and within which their routine trips to work, school, shop, transit stops and recreation places can occur without prejudicing either way, the overall visual framework of the area, based as it is proposed, upon an over-riding historic theme.

(iii) The Visual Plan - detailing of Proposals

Figures 29 and 30 illustrate the visual plan for the study area. The proposals outlined in the Plan are a synthesis of the evaluations made through survey and analysis and from which the basis of a visual design framework has emerged.

(iv) Specific Proposals - Centres and Paths

**CITY SQUARE** - A major pedestrian precinct.

City Square will be developed as a major pedestrian precinct and reception area from which all principal pedestrian on routes converge and extend. Visual corridors are developed along these major paths and
visual links are established to the Charles River and the Boston Harbour. The proposal to develop City Square as a pedestrian precinct conflicts with the existing demands for vehicular circulation space and also with the B.R.A. redevelopment proposals which further intensity the use of this space for vehicular circulation and storage. Contact with the water edges is further reduced in these proposals and City Square becomes less accessible to the pedestrian. To overcome the existing problem and to meet the B.R.A. traffic plan, it is proposed to re-route Rutherford Avenue and place it in out as shown in figure 30. Pedestrian bridges link up Warren Avenue, Water Street and the Charlestown Bridge with City Square.

Removal of the elevated M.B.T.A. line reduces many of the identified problems of noise, dirt, microclimate and lack of light. The building edges of structures fronting on City Square and Main Street are clarified by the removal of the M.B.T.A. line.

The spatial structure of City Square is strengthened by rebuilding in gap sites and through a general structuring of the streets leading from City Square. Spatial size contrast is achieved by controls over the set backs of buildings. These are not geared to a standard dimension as in general urban design practice but according to the nature of the spatial form and size required at a given location.

The system of signs and symbols for way-finding, public information and commercial advertising is controlled, conforming to specific policies. These policies relate to location, grouping and size of signs and to graphics and symbolisation to be used. The system of signs used throughout the entire area will be standardised. Shop fronts and other building facades are subject to the same principles as outdoor signs but with the
aim of achieving diversity within a strongly expressed overall framework.

Lighting of spaces and elements in space is proposed to be structured in such a way that the overall visual form embracing centres and paths is communicated at nights and the nocturnal pedestrian can become oriented as quickly and effectively as is possible during daylight.

From City Square, direct visual and physical linkages will connect the new location of the Constitution which will become a landmark integral with City Square. Also the Warren Street Dam, which is proposed for development as a sailing/marine centre.

As the pedestrian's principal gateway to Charlestown, City Square will provide an information post, facilities for rest, shelter and refreshment. It will also be linked to the new M.B.T.A. station on Rutherford Avenue by a direct, clearly structured pedestrian path.

WINTHROP SQUARE. - A historic centre.

In its present form, Winthrop Square provides outdoor facilities for rest. Both spatial form and facade rendering are clearly expressed. The approach from Park Street into the Square requires strengthening and it is proposed to rebuild structures lining the approaches to Winthrop Square. The historical significance of this Square as the mustering ground for the Minute Men prior to the assault against the British on Breeds Hill is not expressed. It is proposed to redesign the central reservation of the Square as an arena for pageantry and to symbolise the scene immediately prior to the Battle in such a way that it is communicated to the pedestrian. Restoration of various dilapidated structures around the Square to bring out the qualities of original craftsmanship and architectural styling is also proposed.

Construction of a tall landmark to pinpoint the location of Winthrop
Square as a terminal goal to Park Street, which will be seen from City Square will intensity the pedestrian sequence goal structure from City Square to Winthrop, also movement in the reciprocal direction from Monument Square to Winthrop Square. Policies for lighting, paving, signs as applied to City Square will similarly be applicable to Winthrop Square.

**MONUMENT SQUARE** - Historic centre and Viewpoint.

A major goal terminal point, from which it is possible to obtain visual perspective over the entire Study Area and to relate this to the rest of Charlestown and Charlestown to the surrounding region. The primary function of Monument Square is to symbolically express the event of the Battle of Bunker Hill and the achievement in terms of this Battle for American Independence. The full meaning of this major event is not communicated and it is proposed therefore to re-create the scene of the Battle by adapting the space around the Monument to display the "offensive" in model form with life-size figures of the two sides opposed in battle - Gun Emplacements, Command posts and other relevant features of the battle are re-created and the pedestrian is led through the battle field among the figures in such a way that the entire meaning and nature of the foray is expressed with clarity.

The main approach to Bunker Hill will be along Park Street to Winthrop Square, then up the short approach, Winthrop Street, to Monument Square. Arrival to the Monument by bus will be discouraged, since much of the meaning of the battle is planned to be interpreted on foot and read in sequence as a pedestrian. A further problem associated with buses is their size and their frequently destroying the scale of the space within which they are parked, also the blocking off of vistas. It is proposed to develop strong visual linkages north to the Mystic
Channel and south to Town Hill. Prominent structural landmarks will be built on axis to mark the terminal points of both vistas.

**THOMPSWN SQUARE - Commercial Centre**

Problems identified for Thompson Square include poorly defined space, broken surfaces under foot, micro-climate, noise, dirt, lack of light, stress from moving traffic; all of these problems are associated to a large extent, with the elevated M.B.T.A. Unit. It is proposed to develop this as a minor pedestrian precinct oriented around primarily commercial facilities. Thompson Square is the main gateway into the Study Area from the west and it will announce a change in the character sequence on entry.

**NEW CENTRE - WARREN STREET DAM**

The construction of the Warren Street Dam will provide an opportunity for developing the land between the site of the Dam and City Square. Further, it will enable the exposure of the water edge at the Charles River. City Square will be linked visually and physically with the Warren Street Dam bringing City Square into direct visual contact with the Charles River. Through the development of various facilities, including a sail boat marina and an old craft museum, it will be possible to secure a strongly expressed and diverse visual form at the Warren Street Dam.

It is further proposed to establish a water bus terminal at Warren Street Dam. This will be used particularly by Tourists who will alight at Warren Street and embark upon a pedestrian's sightseeing tour of the area, taking in City Square, the USS Constitution, Winthrop Square and Bunker Hill and finally terminating at the Mystic Channel Aquacentre, where they can embark at another water boat terminal. Warren Street Dam has considerable potential for the development of water-oriented
restaurants, and entertainment centres, being close to the Boston downtown section and conveniently served by rapid transit and motor expressways.

**NEW CENTRE - MYSTIC CHANNEL**

The aim again is to develop waterfront facilities and so utilise the visual potential of this unexploited resource. The pedestrian is directed to the proposed Mystic Channel centre from Bunker Hill, down Monument Street North. An aquitheatre on axis with the Bunker Hill Monument will provide a strong structural landmark to close the vista. A recreation centre is also provided among the facilities and there is berthing and repair yards for sail boats. The Mystic Centre, like Warren Street Dam is intended to be a focus for water-oriented recreations. In visual terms, the form of such a development will have a strong diverse visual image.

A water boat terminal will provide both water linkage and overland linkage with Warren Street Dam. The approach to the Study Area from the north will be a visually exciting experience, since all the primary landmarks at the Boston Skyline will be silhouetted against the foreground panorama of the Charlestown Ridge. (Breeds and Bunker Hill).

**NEW CENTRE - USS CONSTITUTION**

In terms of the visual problems evaluated through the survey and analysis of the Study Area, it became apparent that the existing location of the USS Constitution failed to provide sufficient developable potential relative to the visual objectives which we are endeavouring to satisfy in the proposals. Problems of visual isolation, due to immovable structures such as the North East Expressway and the Hoosac Pier Building made the feasibility of establishing visual and physical links with other centres and the major paths system virtually unattainable without very costly
alterations to the physical form of an extensive area, and the likely
demolition of the Hoosac Pier Building.

A derelict waterfront site adjoining the Hoosac Pier Building in
addition to a large expanse of obsolete waterfront warehouses between
the site referred to and the Charlestown Bridge is proposed as an
alternative location for the Constitution. This site was selected
on the basis of the following attributes:

(1) Potential of visual connectedness of new site is greater
because the N.E. Expressway is elevated higher relative to
ground levels.

(2) Closer proximity, enabling direct visual and physical access
of the New site to the City Square, the 'hub' centre in the
visual plan.

(3) The opportunity to develop 'derelict' land, using the USS
Constitution as a means of raising the necessary federal
funds to finance land acquisition and construction costs.

(4) The fact that the Constitution would be in direct visual
contact with downtown Boston, especially the North End.

Reference was made in an earlier section of this study to some of
the possible problems attending the effort to bring about the re-
location of the Constitution, such as closeness to the Boston Navy
Yard.

Two additional alternative new locations were considered also as
possible sites for the Constitution: Warren Street Dam and the Mystic
Channel. The former was ruled out due to problems of scale conflict
arising from the close juxtaposition of the Charlestown Bridge, which
would have the effect of dwarfing the Constitution. A further point was -
reduced visual access from Boston's downtown.

The Mystic Channel, while ideal from a space standpoint, was considered too remote from the historic sections of the area and was ruled out on those grounds.

The Constitution, in its new location, will be anchored to a large wharf where many subsidiary facilities will be developed. The wharf will be in direct physical contact with City Square, subject to similar standards for lighting, signs and paving materials. An outdoor Naval Museum displaying the historical sequence in development of the U.S. Navy up to the present (and continuing) is proposed to be developed on the new Constitution Wharf.

With an existing visitor population of 500,000, it would seem that this number might be easily doubled within the first few years of operating the new Constitution facilities together with the other proposals set out in this study for the pedestrian environment.

**CHARLESTOWN BRIDGE** - North End to City Square.

As the primary linkage route between North End and City Square, Charlestown Bridge has a highly significant role to play in providing, not only the physical means of access, but equally important, a visual experience which will compel the pedestrian to move along it from one side to the other. The survey, see figures 19 and 25 has demonstrated a few of the most apparent visual problems along the bridge. There are insufficient goal elements, limited choice of view or experience and visual quality problems in terms of dirt, micro-climate and noise.

The following proposals are indicated on figure 30, The Visual Plan:

(1) Removal of the elevated M.B.T.A. line.
(2) Widening of pedestrian paths.
(3) Removal of obstructions along the guard rails of the bridge,
i.e. pipes and electrical cables, which can be strung under the bridge.

(4) Construction of look-out posts at points along the bridge to enable more complete viewing from the bridge.

(5) Construction of a lighting system used also to establish scale relationships of pedestrians to the bridge structure.

(6) Structuring of entry points to the bridge and access points from the bridge to City Square and the North End. This is achieved by clarifying the spatial structure through new buildings and tree plantings, also through continuity of paving surfaces. Such continuity will be established with City Square since proposed pedestrian bridges continue the bridge paths over Rutherford Avenue as shown.

(7) Controlling the visualised sequence of landmarks as experienced on walking along the bridge. This is achieved by identification markers which point to and identify given landmarks. Through this system of route marking, the observer is led from one side of the bridge to the other to optimize landmark exposure for a given direction of travel. Terminal landmarks at each end of the bridge signify goal achievement and arrival.

**PARK STREET** - City Square to Winthrop Square.

(see figures 21 and 22, also 25)

Park Street is the most direct route from City Square to Monument Square and as such is proposed to be developed as a primary pedestrian artery and visual corridor. As indicated in figure 25, Park Street is poorly structured and confusing. It is not clear where it leads to from City Square nor in the reciprocal direction from Monument Square. By
planting a strong intermediate landmark in Winthrop Square, and a terminal one at City Square, the basis for visual linkage will be established. Spatial continuity along the route is achieved by building up gap sites and by planting a double row of trees. A further means of strengthening visual and physical connectedness along Park Street will be in the removal of the obstructing access and egress ramps to the N.E. Expressway. These penetrate into Park Street at the inter-section with Warren Street and create a serious traffic hazard, in addition to the problems mentioned above. The opportunity to relocate these ramps will occur with the redevelopment of Rutherford Avenue and with the link-up of the proposed Inner Ring Route to the N.E. Expressway.

Paving surfaces, lighting, facade rendering, and building set backs are subject to the same policies and criteria as outlined for City Square.

WINTHROP STREET - Monument Square to Winthrop Square.

(see figure 22)

Winthrop Street serves as the main visual and physical linkage between Monument Square and Winthrop Square. It is proposed to further strengthen the visual aspects of linkage by extending the tree mass from Winthrop Square to Monument Square.

MONUMENT STREET NORTH - Monument Square to Mystic Channel.

(see figure 23)

The strong northern axial emphasis of this street peters out into a wasteland of derelict railroad yards and factory buildings. The southern axis, i.e. the view from the road in a southern direction, is powerful and dynamic, terminated by the Bunker Hill Monument.

The proposal to develop a water-oriented centre at the Mystic Channel with a visually dominant structure on axis with Bunker Hill
Monument will provide a goal terminus for the observer moving in a northern direction.

The direct visual relationship between the two important centres suggests an emphasis on the linear structure of Monument Street. This will be achieved visually by planting a continuous avenue of trees by widening the sidewalks, creating in essence a pedestrian mall within the street structure. This latter proposal will necessitate one-way traffic in Monument Street.

Figure 30 illustrates in more detail further modifications to the spatial form of Monument Street and the sequence goal structure.

**WARREN AVENUE** - Warren Avenue Dam to City Square.

('E' on figure 29).

Warren Avenue is developed as a pedestrian mall with separate access routes for vehicular traffic. The mall will lead directly from City Square to Warren Street Dam as shown in figure 30. It will be subject to design policies similar to those for City Square.

**MAIN STREET** - City Square to Thompson Square.

(see figures 14 and 15)

Removal of the elevated M.B.T.A. Line will form the major visual improvement to this street. Building structures scheduled for demolition, due to decay, approximate 30% of total facade. 20% of existing facade is already broken through removal of structures. Remaining 50% of building facade will be restored, subject to policies for surface textures, colours, signs and lighting. New buildings will conform to a differential pattern of set-backs to achieve an optimal sequence spatial structure.

Particular structural emphasis will be established at intersections
with major streets, marking direction, decision points and the possible change of environments and goals.

In functional terms, main street will be revamped as a shopping and small craft street. Sidewalks will be widened and one-way traffic will continue to operate.

**CORDIS STREET** - Main Street to Bunker Hill Street.

The emphasis on this street is on its historic building structure. This will be preserved and the emphasis further developed. Minor street linkages diffuse from Cordis Street through to Winthrop Square. It is proposed to develop minor path sequences from Cordis Street through the internal structure of this historic section. Policies for traditional lighting fixtures, fences, paving materials and gardens are to be applied in the proposals, to achieve a deepened sense of the history and traditional way of life in Charlestown in post-federal times. (Cordis Street was one of the most fashionable in Charlestown one hundred years ago).

**MONUMENT STREET SOUTH** - Bunker Hill Street to Main Street.

The main object is to achieve a visual corridor from the Harvard Mall to the Bunker Hill Monument. This will be achieved by removing a group of semi-derelict buildings on Main Street which currently block off the 'view' of the Monument. It is further intended to develop a major landmark in the Harvard Mall which can be seen clearly from the Bunker Hill Monument.

By widening the sidewalks along Monument Street South and planting an avenue of trees, linking up with those in the Harvard Mall, a strong visual link will be established.

(Flood lighting of major landmarks and centres and use of more subdued or coloured lighting in streets will emphasise the overall structure of the visual form.)
8. IMPLEMENTATION OF DESIGN PROPOSALS

This is the final section of the CASE STUDY and we shall examine a number of specific aspects of the problem of securing the implementation of the visual design proposals made, and further, will review a number of policies which will be required to guide the implementation process of these proposals.

(i) Feasibility of the Proposals

How feasible is it to carry out a plan for the visual experience of the observer in motion? Who is going to provide the funds for such a plan? What financial returns can be expected? Who is going to benefit from such a plan?

These questions fall roughly into two categories: (1) feasibility in the physical sense, that is, manipulating the environmental structure in such a way that visual objectives for pedestrians can be met; and (2) feasibility in the political, administrative, legal and fiscal sense.

In terms of the first category, we can be reasonably confident, given the design and constructional skills, to interpret the proposals into reality.

In the second category there are some difficult problems to be overcome. These arise mainly from the proliferation of interests which a pedestrian or vehicular path involves. There is no single overall administrative or political authority or framework within which proposals of this kind can be executed in full.

We shall examine a number of problems identified with each of the organising urban bodies.

Legal Problems

Property ownership and rights pose the first problem. The path
structure is normally integral with the public right of way, which also embodies roads and services. The total pedestrian environment, however, involves more than the path surface. The primary space enclosing elements, eg. facades of buildings, are as fundamental to the pedestrian environment as the path surface, but these are for the most part, in private ownership.

Proposals have been made for diversifying the spatial structure along pedestrian routes by controlling the set-backs of buildings to achieve a differentiated distance of each building with the kerb line. Such a proposal would involve a highly complicated system of zoning regulations or municipal standards which specify the set-back, not in terms of the entire length of the street, but for each land holding. To implement such a regulation on the basis of optimizing visual form, would be most difficult to achieve, particularly in instances where the property owner insisted upon his building line being as close to the road as that of his neighbour, where in spatial terms, say the building line was at the path edge. In such an instance, one might refer to our aims for spatial diversity as "spatial discrimination". A policy to achieve our aim might be to publically acquire appropriate vacant lots or indeed an entire street for re-sale and write into the title deeds of the individual properties, a clause laying down conditions for set back, height and widths. Where it was wished to achieve a differential spatial pattern these heights and widths would vary. A further policy might be to identify some significant public use for such spaces such as sitting areas, plazes, malls, etc., which would strengthen the case in order to achieve our visual/spatial objectives. Controls for facade rendering, (colour and textures) lighting systems and fixtures, signs for advertising etc., have also strong legal overtones and to
introduce regulations for control in areas where there were previously none would possibly invite considerable opposition from property owners.

If the overall public good can be demonstrated through the introduction of controls for the above elements, it is likely that a high level of co-operation will be achieved as in Magdeline Street, Norwich, where individual property values were shown to increase considerably as a result of co-ordinated visual controls.

A major problem in the institution of controls is the liability of such controls becoming the accepted standards for all time with the loss of flexibility to meet new environmental/perceptual demands.

A further legal problem connected with property is converting private routes into public rights of way. The simplest way of overcoming this is by direct public purchase of rights, or in some instances, simple negotiation for public access is adequate. This particular problem is likely to arise in securing access routes through the historic residential sections of the Study Area and where much of the interest and historic process is revealed in the rear spaces between these structures. It is not intended in our proposals that these properties be taken out of private ownership.

**Political/Administrative Problems**

The problems likely to arise in terms of the proposals concerning the political and administrative machine are mainly those concerning the sub-division of the various actions into various sectors for execution and administration. For example, who will take responsibility for what?

The Boston Redevelopment Authority are acting in the capacity of a Development Commission for the redevelopment of Charlestown. It is likely that they would assume the bulk of the responsibility for implementing the
visual proposals. There is, however, the important question in regard to who is going to administer the facilities once they are developed. This problem becomes more critical in relation to the New Centres which depend upon a few major facilities rather than the heterogeneous and fine-grained situation in the older commercial centres. It is presumed that the U.S. Navy will continue to administer the U.S.S. Constitution in its new location and also the adjoining Navy Museum. The Warren Street Dam and the Mystic Centre will likely have a shared private/public control although in overall public ownership.

In regard to maintaining and restoring historic sites and buildings, it is proposed that this will be the responsibility of the property owner who will, however, be provided with financial incentives such as improvement grants and immunity from property taxes, in return for which reasonable public access must be allowed. The various levels of access could be laid down in terms of the nature of each property and the extent of grant received.

**Fiscal Problems**

A major problem will be to get the municipality to accept a much higher level of expenditure for the outdoor environment in order to achieve the objectives laid down in this Study for the pedestrian's perceptual experience. Such expenditures would occur in extending the width of pedestrian paths, bridging over dangerous or busy traffic intersections, improving standard of paving, producing a higher standard of signs and symbols, providing more elements such as sculpture, statues and other landmarks, comprehensive lighting systems, more facilities for shelter and rest, and more landscaped spaces.

Federal grants are now available for urban 'beautification' although
it is also possible to raise funds through Urban Renewal programmes. This latter means will provide the bulk of the funds for the Redevelopment of Charlestown and in the main our proposals will come within the scope of this.

Financing of large scale projects, such as the New Centres, including the U.S.S. Constitution would be sought by special grants available for developing recreation centres, historic sites and buildings, and through assembling facilities for private investment.

(ii) Implications of the Proposals

The emphasis of the proposals to develop the potential of existing environmental structure for the pedestrian sequence experience implies sub-optimization of conditions for vehicular circulation and the experience from the road as opposed to the footpath. This implication is especially valid in the case of City Square, where conditions for the pedestrian due to a particularly high density of vehicular traffic, are highly dangerous apart from stresses from noise and fumes. The actions prescribed in this example, remove through traffic from City Square by diverting this along the new Rutherford Avenue. Only local traffic which has low volume density will filter through City Square. Only in a few instances are vehicles and pedestrians entirely segregated. It is felt that a balanced mix of vehicles and pedestrians in an integrated path system achieves a much higher level of diversity of activities and that segregation doesn't necessarily provide the basis for satisfying our design criteria.

Parking regulations will eliminate parking from given streets and centres, with facilities provided at convenient alternative locations. These streets in general include all of the routes detailed in the
evaluation, with the exception of Main Street, where it is felt desirable to retain the facility of alongside-kerb parking.

Where local traffic densities are high, pedestrian bridges are proposed to divert pedestrians over the sections of route concerned. The bridges themselves have visual significance and are used as structuring elements in establishing the visual form.

The implication of the proposals, fully implemented will go are beyond the scope of the pedestrian's visual experience. Exposure for instance of the historic structure in the area, will attract a much higher level of tourist trips. The existing single-goal oriented tourist Centres, Bunker Hill and the U.S.S. Constitution, if fully integrated into the visual structure of the area as a whole, while still acting as major 'magnets' will be two major goals in a multi-goal oriented tour within the area. Since tours within the area will be predominantly based upon pedestrian circulation, the opportunity will be provided for commercial facilities to develop at points along these 'tourist' routes and to tap into a potentially promising retail marketing area. Such facilities will complement our perceptual objectives by diversifying the potential range of facilities. Policies will control the location of those facilities and the scope of their services relative to criteria for overall design.

Finally, the implications of the proposals for local residents: these will range from tighter controls in terms of zoning and regulations governing specific properties. The affect of these regulations will be to increase public jurisdiction over the facades of buildings thereby extending the public interest in the pedestrian environment to include in addition to the horizontal 'right of way', the vertical surfaces which define and enclose pedestrian space.
Apart from those essentially visual implications, are those which result from the actions inspired by visual objectives, such as increased investment in the area, conservation of property, social diversity achieved through stabilisation of the community be reversing the trend of out-migration through increasing property values, changes in the employment structure with the tendency to move from a base-oriented economy to one which is geared more to providing services - this coming about through exploiting the potential of the tourist market.

To mirror the visual objectives from the Study Area in more human terms than was hitherto possible bearing in mind the aim of this thesis to formulate and apply a method for evaluation and designing for the pedestrian perceptual experience, a quotation taken from a study of neighbouring East Cambridge seems appropriate in terms of Charlestown.

"In its physical make up the district is an entity. It has specific limits that save it from endless streets, the monotonous uniformity that dissolves one street district into the next. Because of distinguishable limits, it is immediately apparent when one enters or leaves East Cambridge. Yet within this area of less than 35 blocks, there is considerable variation in character from one street to the next. Those who walk through the area find pleasure in this variety and those who live there take pride in it".

(iii) Strategies and Priorities

There are three levels of action involved in the implemention of the proposals:

(1) Large-scale public projects for
- Highway Works
- Clearance of derelict land and properties including the M.B.T.A. transit line.
- Development of new major facilities including the New 'Construction' Wharf.
Warren Avenue Dam
Mystic Channel Center
City Square Redevelopment

(2) Public projects of intermediate scale for:
- Improvements to streets and pedestrian paths, including:
  - Resurfacing pedestrian paths
  - Signing pedestrian routes
  - Lighting systems
  - Tree planting
  - Developing minor facilities such as sitting areas, plazas, malls, and children's play areas.

(3) Non-public projects involving property owners for:
- Conservation and rehabilitation of historic buildings and spaces
- Converting private routes into public rights of way.
- Restoration or modification of building facades of buildings in private ownership.

All three levels of action require entirely different strategies to secure implementation. The first may be said to be the Federal level since the capital costs involved will require both control Government approval and financial support. Each of the New Centers will be viewed as a discrete project requiring specific detailing of the nature and extent of the proposals.

In the second instance - the local Authority level, the proposals come more within the range of Capital improvements and while Federal grants in aid of such improvements are made available, the local Authority will retain the major jurisdiction over them.

Finally, the third level which concerns the individual property
owner. Here we are involved with more than conservation and giving access. This level cannot be forced on a neighbourhood by bureaucratic decision. The strategies used to secure implementation must directly involve the community and obtain their co-operation in the decisions to be made.
9. **SOME SPECIFIC POLICIES TO GUIDE IMPLEMENTATION OF VISUAL OBJECTIVES FOR THE PEDESTRIAN ENVIRONMENT.**

In the absence of more complete controls over the visual form of the pedestrian environment, and where the form is subject to a wide range of demands from other valid areas, direct achievement of our visual objectives is generally not feasible. By the formulation of policies, however, which can relate visual criteria with other urban criteria and later, actions; a strategy which in the long term will yield the same results as direct visual action is devised.

The aim here is to list some of the more effective policies which can be used to achieve visual aims.

(i) Zoning regulations embodying conditions for differential setbacks of buildings and descriptions of the things one cannot do to the facades of buildings rather than confining the requirements to a few 'can do's'.

(ii) Advisory service on design - distribution of prototype solutions to various design problems. Identification of problem areas along path system and revealing of causes - free advice if 'cause' factor is a private individual or corporation.

(iii) Advisory criteria for new buildings and locations of new roads.

(iv) Control of siting of new development.\]

(v) Prototype designs for landscaping, sign design.

(vi) Prototype designs showing idealised sequence of spaces, views, activities and quality sequences.

(vii) Policies for preserving historic or important buildings and areas of special significance.

(viii) Identification of key routes and centres for special investment.

(ix) Exposure of the significance of history of industrial processes by policies requiring visual connectedness to historical landmarks and industrial plant.
IV. CONCLUSION

AN EVALUATION OF THE METHOD

Several major problems in the method have become apparent on its application to the Case Study Area. These relate particularly to the tendency to generate a discursive aura around the central problem and to fail to get quickly enough to the vital issues and to the synthesis of proposals based only upon such vital issues. In this latter regard the visual Analysis prepared by Kevin Lynch for the Town of Brookline was particularly helpful. In methodological and conceptual terms this thesis has not progressed beyond the frontiers established by Lynch in his work. The only claim which can be justifiably made is that it is a further case study based on Lynchian principles but focussed specifically, however, upon the perceptual experience of the pedestrian rather than upon the total synthesis of visual experiences which have relevance upon the entire visual structure of the city. The goals are narrower and are geared only to producing proposals for the pedestrian path environment and the sequence experience structure.

A review of the problems considered to be of relevance in a critique of the method is made under the separate stages of application as follows:-

(i) Analysis Framework

The aim was to attempt to define all the relevant elements of the pedestrian environment and sequence experience.

These elements were to be the basis for collecting data in the field and later, for evaluation on application of design criteria to
test their performance.

In practice it was found to be unrealistic to consider the performance of all elements in an empirical way. The observer had to depend upon his own sensory prowess and subjective judgement revealing problems where they 'appeared' to exist. On this basis, it was far more realistic to consider only two principal elements of the pedestrian environment: the path structure and the centre structure. The evaluative criteria, an extension of our overall objectives were developed, therefore, on the basis of the structure, identity, meaning, diversity and comfort associated with paths and centres. The more detailed level of evaluating qualities of environmental space were looked upon as the causative factors of problems, rather than in the light of being discrete problems. For example the problem of stress or confusion existing as a cause of noise, darkness, scale surface texture.

(ii) Survey Technique

The main problem exposed here was in the technique of data-gathering — the actual process of observing and recording. Establishing the principal routes and centres for more detailed study resulted not from volume of traffic/pedestrian flow but more from what seemed to be the logical visual relationship of these paths and centres. It was on the basis of purely visual criteria that the major proposals were made for these routes and centres. In practice, statistical backing in terms of route/centre activity volumes would be an essential empirical corollary to endorse visual analysis.

Visual sequence form was recorded both by mapping and by photographs. Both techniques were used simultaneously which proved to be unsatisfactory. The form of camera used was also unsuitable (a 35 mm still). On a future
exercise of this kind, the use of a 180° wide-angled lens movie camera with single frame recording is recommended. This would provide a complete sequential photographic record of the survey routes in forward and reciprocal directions.

An audio-visual recording device would be ideal since the observer's uninhibited impressions of the route would be available for more unbiased evaluation. There is clearly a great deal of research awaiting to be carried out in this area. Use of an eye-marker centre is currently being perfected for recording lay people's impressions of the view from the road. Such a device when perfected could be utilised equally well from pedestrian visual recordings.

Use of mechanical audio-visual recording techniques does not entirely substitute on-route sketches of significant elements or visual forms. Those are particularly important since they are the pre-screened images as adjusted by individuals guided by their own value systems. We can derive from such sketches and ad hoc descriptions, what people feel about a particular area of the city and how they identify and consider important problems.

We can also ask them what they would like to see in their environment and what changes they would like to come about.

(iii) Application of Criteria

In practice this proved to be mainly an internal exercise after the field survey had been undertaken. The field survey operated, therefore within only a loose framework of objectives. Due to this, much superfluous material was generated and main problems tended to get clouded. It has become clear within the experience of this study that criteria for evaluating the performance of the various elements should be made explicit prior to undertaking field study. The disciplines imposed by determining what is ideally required will screen out the irrelevant and
achieve an atmosphere of clarity in which to formulate proposals.

Problems and Opportunities Drawings, focalising upon critical areas, were the end product of the evaluative process. A technical problem in the preparation of those drawings was the large scale of the base map used. This scale necessitated drawing more details of the forms of paths, centres and districts than is appropriate or optimal for the type of diagrammatic representation sought in using this kind of map technique. The drawings produced, therefore, have a coarser texture and do not communicate the major problems as effectively as similar drawings at a smaller scale.

(iv) Questionaire Technique

Unfortunately, the questionnaire technique which has been proven to be a highly relevant sequel to the trained observer's survey, was not used in this study. Insufficient was known about the uses of the pedestrian environment in the CASE STUDY AREA nor was it known how relevant the criteria adopted for the evaluative process were.

It is now clear from the kinds of proposals emerging from the evaluations made, that much more should have been known about how the local residents felt about their environment. Because of the high percentage of tourists visiting the area it would also have been appropriate to have tested their attitudes, and also those of the people who cater for tourists.

A broadly based and incisive citizen questionnaire, therefore, would be a next step in Charlestown, prior to implementing the proposals as presently constituted.

The results of a citizen questionnaire of say an approximate sample
of 60 - 120 persons chosen on the basis of being representative of the total resident and tourist population (the two classes being evaluated separately) to maintain internal consistency would be correlated with those of the trained observer and modifications made accordingly in terms of the proposals.

(v) Design Proposals

Synthesis of proposals from the results of an evaluation of problems and opportunities identified in terms of visual criteria only, is likely to produce malfunction and inconsistency with other community goals.

Since the aim of this thesis was to demonstrate the potential in optimizing the visual form of the pedestrian environment and of the pedestrian's sequence experience, in an existing urban situation, it was purposely an intent, not to become involved in projecting the means for achieving compromise with other objectives or of the ability of the results of decisions made to be capable of change (environmental evolution). It is clearly understood that the visual plan for a community must be fully integrated with all the functional and social processes of that environment and with the aspirations of the residents of the community.

A further comment concerns the actual proposal synthesing process. Design is not only a matter of overcoming recognised problems or developing identified potential. It is also a process of instituting new opportunities and taking a lead in demonstrating and achieving change.

This approach was taken in respect of developing the proposals for the Study Area.
(vi) Implementation

A review of the possible problems, feasibility, agencies and the implications of implementing visual proposals was made.

This review was purposely held at a generalised level dealing only with what seemed to be the major issues involved in implementing the visual proposals in Charlestown.

Working within a planning brief embodying other kinds of proposals, the visual plan would normally guide decisions and actions to satisfy visual criteria rather than for the visual plan to directly project visual action programmes. In the case of existing run-down environments such as Charlestown there is, however, a strong case for a VISUAL ACTIONS PROGRAMME.
REFERENCES

1. Kevin Lynch
   Image of the City

2. Erino Goldfinger
   The Sensation of Space
   Architectural Review, December 1941

3. Hans Blumenfeld
   Scale in Civic Design
   Town Planning Review, April 1953.

4. H. Maertens
   Der Optische Maastab in den bildenden Kuensten

5. Camillo Sitte (Transl. G.R. & C.C. Collins)
   City Planning According to Artistic Principles


7. Phillip Thiel
   A Sequence - Experience Notation for Architectural and Urban Spaces

8. Charlestown Urban Renewal Program Report
   Boston Redevelopment Authority 1963.

9. Cambridge Historic Society