Problems of Population Density in Boston

by

Victor Fischer

B.A. University of Wisconsin, 1948

Submitted in partial fulfillment of the requirement for the degree of Master in City Planning.

Head, Department of City Planning

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Massachusetts Institute of Technology

June 1950
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Lastly, my sincerest thanks to my wife Gloria for her aid in editing this work.
Boston, Massachusetts
June, 1950

Professor Frederick J. Adams
Department of City Planning
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

Dear Professor Adams:

In partial fulfillment of the requirements for a Master in City Planning Degree I submit this thesis entitled,

Problems of Population Density in Boston.

Respectfully submitted,

Victor Fischer
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INTERBODUCTI0N

Large areas of Boston have been proposed for redevelopment under the Housing Act of 1949. Among them are some of the most densely populated areas in the city. Assuming that it is desirable to have lower densities than now exist in those areas, the question is -- With redevelopment, can population densities be reduced?

It is the purpose of this thesis to attempt to answer this question. In order to do that, the thesis will establish optimum densities for areas considered overpopulated, and calculate excess population and housing need. It will then investigate possibilities of housing excess population outside the high-density areas.

The thesis is divided into two parts: (1) Boston's Population Excess, and (2) Availability of Residential Land. In the first section, desirable dwelling types will be used as the primary determinant in establishing optimum density and calculating housing need. In part two, the feasibility of land reclamation and satellite town development will be discussed.
Part I

BOSTON'S POPULATION EXCESS
DESIRABLE DWELLING TYPES

Urban redevelopment offers the opportunity to improve the structure of our cities and the conditions under which people live. It is, therefore, important to consider carefully those factors that can contribute to the improvements desired. The types of dwellings used to build up former slum areas will determine the immediate environment in which people will live for many decades to come.

Building types should be considered not only from the point of view of how many people they can house, but also from their ability to help meet basic family needs. In this chapter, dwelling types will be analyzed primarily with respect to their ability to meet basic family needs. Since most of the new development would be in central areas, which justify a relatively greater population load, only dwelling types capable of housing large numbers of people will be considered. Essentially, this comes down to a choice between elevator buildings and low walk-ups.

First of all, the needs of families with children will be considered. Residences with ground access are generally conceded to be the preference of most families with growing children. Such preferences are given weight by the recommendations of the American Public Health Association's Committee on the Hygiene of Housing. In Planning the Neighborhood, the Committee "... supports the view that one- and two-family houses, including their row and group forms, are the generally preferable type for families with children. Although the modern types of walk-up apartments, if they are not more than three stories high, would seem to satisfy the requirements of families with children, even closer proximity to the ground is desirable for families with small children or aged persons."
Numerous other groups have reflected the same point of view, including the Boston City Council. Last January the Council asked the Boston Housing Authority to construct two-family garden-type apartments. #

What lies behind such preferences? For one thing, in two- and three-story buildings children have easy access to play areas in proximity of the home. In many cases, the mother can go about her household tasks and still keep an eye on her children. The possibility of having a small private garden is another factor that plays a role in dwelling preferences.

These are considerations that lead to the choice of three-story walk-ups as the most desirable dwelling type for families with children, under the circumstances given (i.e. in centrally located areas.)

Different criteria must be considered in selecting dwelling types for other segments of the population. Here the multiple-dwelling is not only satisfactory, but it may offer very distinct advantages. Apartment living involves minimum maintenance responsibility on the part of tenants. For single persons, young married couples without children, and old couples this may have far greater appeal than having a private garden or direct access to outdoor areas. Higher density apartments for these groups, utilized in combination with two- and three-story dwellings can help accommodate a greater number of people on a given area of land.

In establishing distinct residential buildings for distinct types of families, it must be remembered that there is real danger of imposing

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# Boston Globe, January 24, 1950.
segregation between family types. An artificial division that might tend to decrease neighborhood identification and community participation on the part of childless families could very well be created. Since one of the goals of neighborhood development is the creation of just those values, such a result would be undesirable.

It may be desirable, therefore, to provide for a mixture of family types in all dwelling types: provide a certain proportion of facilities in apartment buildings for families with children (possibly on the first two floors), and build low dwellings with accommodations for young or aged couples.

Building height relationships may also be used to achieve greater harmony within neighborhoods. 13- or 20-story buildings, though they might create dramatic contrasts with 3-story structures, tend to emphasize the differences between the units and the people inhabiting them, and should probably be avoided. 6- and 3-story units, on the other hand, could easily be site-planned to create harmony between buildings. The units thus provided would be sufficient in most parts of the city. Only in areas strategically located in relation to the downtown district would it be justifiable to resort to the use of 13-story buildings. These areas can be expected to accommodate a greater proportion of childless families.

**OPTIMUM DENSITY PATTERN**

Within the political and geographic boundaries of Boston are fifteen health and welfare areas.* These areas will be used as the

---

* Data used and obtained in this chapter are summarized in Tables 1 and 2.  
* See map, p. 6.
<table>
<thead>
<tr>
<th>community</th>
<th>1940 pop</th>
<th>prop pop</th>
<th>decrease</th>
<th>per cent change</th>
<th>1930-30</th>
<th>1930-40</th>
<th>1940-***</th>
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</thead>
<tbody>
<tr>
<td>Back Bay</td>
<td>39,502</td>
<td>39,502</td>
<td>none</td>
<td>- 2.7</td>
<td>+ 1.6</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Brighton</td>
<td>63,367</td>
<td>63,367</td>
<td>none</td>
<td>+33.9</td>
<td>+12.4</td>
<td>0</td>
<td></td>
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<td>Charlestown</td>
<td>25,287</td>
<td>19,900</td>
<td>5,387</td>
<td>- 7.6</td>
<td>-19.2</td>
<td>-22.2</td>
<td></td>
</tr>
<tr>
<td>Dorch North</td>
<td>124,223</td>
<td>124,223</td>
<td>none</td>
<td>+ 4.7</td>
<td>+ 1.7</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Dorch South</td>
<td>77,350</td>
<td>77,350</td>
<td>none</td>
<td>+46.1</td>
<td>+ 3.9</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>East Boston</td>
<td>56,928</td>
<td>48,450</td>
<td>8,478</td>
<td>- 2.5</td>
<td>- 3.9</td>
<td>-14.9</td>
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<td>Hyde Park</td>
<td>25,192</td>
<td>25,192</td>
<td>none</td>
<td>+34.5</td>
<td>+ 2.8</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Jamaica Pl.</td>
<td>37,294</td>
<td>37,294</td>
<td>none</td>
<td>+21.0</td>
<td>+ 2.2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>North End</td>
<td>19,698</td>
<td>6,390</td>
<td>12,308</td>
<td>-12.2</td>
<td>-29.2</td>
<td>-65.2</td>
<td></td>
</tr>
<tr>
<td>Roslindale</td>
<td>38,278</td>
<td>38,278</td>
<td>none</td>
<td>+37.7</td>
<td>- 1.8</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Roxbury</td>
<td>107,002</td>
<td>107,002</td>
<td>none</td>
<td>+ 0.1</td>
<td>- 0.9</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Sou. Boston</td>
<td>54,364</td>
<td>41,000</td>
<td>13,364</td>
<td>- 3.7</td>
<td>- 5.2</td>
<td>-24.5</td>
<td></td>
</tr>
<tr>
<td>South End</td>
<td>52,442</td>
<td>37,100</td>
<td>15,342</td>
<td>-17.5</td>
<td>-10.1</td>
<td>-29.3</td>
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<tr>
<td>West End</td>
<td>27,278</td>
<td>16,050</td>
<td>11,228</td>
<td>-31.1</td>
<td>- 2.7</td>
<td>-41.3</td>
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</tr>
<tr>
<td>W. Roxbury</td>
<td>19,476</td>
<td>19,476</td>
<td>none</td>
<td>+36.0</td>
<td>+ 15.9</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>TOTAL / AVE.</td>
<td>767,981</td>
<td>702,394</td>
<td>67,067</td>
<td>+ 4.5</td>
<td>- 1.3</td>
<td>- 8.8</td>
<td></td>
</tr>
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</table>

*Table 1*
### Density and Dwelling Types

<table>
<thead>
<tr>
<th>community</th>
<th>net res land-A.</th>
<th>existing pers/unit</th>
<th>existing pers/acre</th>
<th>prop. exist. unit/acre</th>
<th>prop. dwelling types-pred.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back Bay</td>
<td>202.6</td>
<td>2.7</td>
<td>196</td>
<td>74</td>
<td>mixed</td>
</tr>
<tr>
<td>Brighton</td>
<td>874.2</td>
<td>3.4</td>
<td>73</td>
<td>21</td>
<td>3-st.</td>
</tr>
<tr>
<td>Charlestown</td>
<td>115.9</td>
<td>4.3</td>
<td>221</td>
<td>52</td>
<td>3-fam.</td>
</tr>
<tr>
<td>Dorchester N</td>
<td>1206.6</td>
<td>4.1</td>
<td>103</td>
<td>25</td>
<td>3-fam.</td>
</tr>
<tr>
<td>Dorchester S</td>
<td>1118.3</td>
<td>4.2</td>
<td>69</td>
<td>16</td>
<td>3-fam.</td>
</tr>
<tr>
<td>East Boston</td>
<td>279.8</td>
<td>4.3</td>
<td>203</td>
<td>47</td>
<td>3-fam. 3-st.</td>
</tr>
<tr>
<td>Hyde Park</td>
<td>806.9</td>
<td>4.1</td>
<td>31</td>
<td>8</td>
<td>2-fam.</td>
</tr>
<tr>
<td>Jamaica Plain</td>
<td>813.1</td>
<td>3.9</td>
<td>46</td>
<td>11</td>
<td>3-fam.</td>
</tr>
<tr>
<td>North End</td>
<td>21.3</td>
<td>4.3</td>
<td>924</td>
<td>215</td>
<td>4-st. 3-6-13 story</td>
</tr>
<tr>
<td>Roslindale</td>
<td>790.6</td>
<td>4.2</td>
<td>43</td>
<td>11</td>
<td>2-fam.</td>
</tr>
<tr>
<td>Roxbury</td>
<td>735.2</td>
<td>3.9</td>
<td>146</td>
<td>38</td>
<td>3-fam.</td>
</tr>
<tr>
<td>South Boston</td>
<td>258.1</td>
<td>4.0</td>
<td>211</td>
<td>53</td>
<td>3-fam. 3-st.</td>
</tr>
<tr>
<td>South End</td>
<td>142.1</td>
<td>4.0</td>
<td>369</td>
<td>92</td>
<td>3-st. 3-6-13 story</td>
</tr>
<tr>
<td>West End</td>
<td>73.7</td>
<td>3.6</td>
<td>379</td>
<td>102</td>
<td>4-st. 3-6-13 story</td>
</tr>
<tr>
<td>West Roxbury</td>
<td>699.7</td>
<td>3.9</td>
<td>28</td>
<td>7</td>
<td>1-fam.</td>
</tr>
<tr>
<td><strong>TOTAL/AVERAGE</strong></td>
<td><strong>8148.1</strong></td>
<td><strong>3.9</strong></td>
<td><strong>94</strong></td>
<td><strong>24</strong></td>
<td><strong>22</strong></td>
</tr>
</tbody>
</table>

(2)(p.13)(1)
basic units for calculating optimum densities. Density determinants will be dwelling types, as discussed in the preceding chapter, and the net dwelling densities recommended by A.P.H.A.* Other factors, such as zoning, character and composition of population, and proximity to the center of the city must also be taken into consideration.

On the basis of the desirable density established for each community, the population reduction necessary to achieve that density will be computed. Since there is no excess of industrial, commercial, and public land in the high-density communities, the assumption is made that no land in such uses will be given over to residential development. Similarly, it is assumed that no land presently in residential use will be taken over for any other use. Therefore, to obtain future community population and population reductions, optimum densities will be applied to the existing amount of residential land.

Briefly, the existing density pattern of Boston is as follows:† There is a high concentration of population at the heart of the city. The North End, one of the oldest sections of Boston, has had excessive densities for over a hundred years, and at the present time has a net residential density of 924.3 persons per acre. This is the most densely populated area in Boston. South and west of the North End are areas having net densities of around 350; next follows a ring of 200-250 persons per net acre densities. From there residential densities continue to decrease with distance from the center. Actually, most of the low-density areas at a distance from the center of Boston are outside

* A.P.H.A., op. cit., p. 39. See Table 3.
† See Map, p. 10.
NET DENSITIES

0 - 8 FAMILIES PER NET ACRE
9 - 12
13 - 20
21 - 40
41 - 80
81 +

NON-RESIDENTIAL LAND

SOURCE: Boston Planning Board - data based on 1955 Massachusetts census

MAP OF THE CITY OF BOSTON
POPULATION DISTRIBUTION

- EACH DOT EQUALS 500 PEOPLE IN 1940

NOTE - spot map by Massachusetts State Planning Board showing 1940 census tract totals as proportioned against 1935 distribution pattern.
the city limits. Within the city limits, only in the south is there a sizable amount of low-density residential development.

It is interesting to note that the overall population density of Boston is considerably higher than that of cities of comparable population.*

For specific density calculations, communities are arranged according to their existing residential densities into high-, medium-, and low-density groups.

**High-density Communities**

The North End is the most densely populated area in Boston. 19,698 people are crowded onto twenty acres, at a density of 215 dwelling units per net residential acre. One indication of the degree of overcrowding in the area is that 15.8% of the units have more than 1.5 persons per room. This is considerably above the Boston average — 3.9% of units with more than 1.5 persons per room.#

In addition to population congestion, the North End is characterized by a high proportion of sub-standard housing due largely to the age of the dwellings. These, plus the characteristics of declining numbers, and a population of foreign origin or of extreme heterogeneity, are typical of most slums in large American cities.

The Boston Planning Board has proposed redevelopment for the whole North End. And though it is recognized that this would almost certainly

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* 16th U.S. Census, 1940: Boston—16,700 persons/sq.mi.; St. Louis—13,300; Pittsburgh—13,000; Cleveland—12,000; Baltimore—10,900.
# Greater Boston Community Council, *The People of Boston and its Fifteen Health and Welfare Areas*, Boston, 1944, Table III.
### A. P. H. A. RECOMMENDED NET DWELLING DENSITIES ....... Table 3

<table>
<thead>
<tr>
<th>dwelling type</th>
<th>desirable</th>
<th>maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-family detached</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>2-family detached</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>2-story row house</td>
<td>16</td>
<td>19</td>
</tr>
<tr>
<td>2-story multi-family</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>3-story multi-family</td>
<td>40</td>
<td>45</td>
</tr>
<tr>
<td>6-story multi-family</td>
<td>65</td>
<td>75</td>
</tr>
<tr>
<td>13-story multi-family</td>
<td>85</td>
<td>95</td>
</tr>
</tbody>
</table>

**Source:** American Public Health Association, Planning the Neighborhood. Adapted from Table 4.

**Sources for Tables 1 and 2:**

(1) Greater Boston Community Council, The People of Boston and its Fifteen Health and Welfare Areas, 1944, Tables I and III.

(2) Boston City Planning Board. (See Appendix A for acreages by residential types and non-residential uses.)
destroy the present character of the community -- its traditions, institutions, and family ties that keep the people there despite overwhelming deterioration* -- from the point of view of the planner, there is no question but that total slum clearance in the North End is both necessary and desirable.

Since the North End is strategically located in relation to the downtown area, it is likely that redevelopment would introduce distinct changes in the composition of the population. Small family groups and a high percentage of single persons can be expected to seek residential facilities therein. For this reason, a development of 3-, 6-, and 13-story apartments is recommended. A combination of these dwelling types permits residential development at a density of 75 dwelling units per net residential acre. To reduce the existing density (215) to the recommended density (75) would entail a decrease of 12,800 persons in the population of the North End.

Densities in the South End and West End are 92 and 102 units per net acre, respectively. Both areas are centrally located. They contain a high proportion of small families and a large number of rooming and boarding houses.

As in the North End, a combination of the same three dwelling types -- 3-, 6-, and 13-story buildings -- is recommended for the South End and the West End. However, it is recommended that fewer 13-story buildings be erected in these areas than in the North End, and that densities of 65 dwelling units per net acre be established.

The total population reduction required to achieve the desired

* Walter Firey, Land Use in Central Boston. Cambridge, Harvard University Press, 1917. Chapter V.
density in both communities is 26,570 persons.

A moderate excess of population exists in East Boston, Charlestown, and South Boston. Existing densities in these communities vary from 47 to 53 dwelling units per net residential acre. Families are large in these areas, and the proportion of children to population is above average. A net density of 40 dwelling units per acre, based on 3 story dwellings, is proposed. Population decrease amounts to 27,500 persons.

Although the existing density of the Back Bay is 74 units per net residential acre, this area is not in need of redevelopment or major rehabilitation. Residential buildings are in very good physical condition. The area is characterized by an extremely high proportion of hotels, rooming and boarding houses, and small apartments.

No population reduction is required because the Back Bay has a very small number of persons per household unit (2.7), and has the smallest proportion of children per total community population in Boston (4.0%).

Medium-density Communities

Brighton, Dorchester, North, and Roxbury meet A.P.H.A. desirable density standards and no population decrease is needed. Their densities are 21.5, 25, and 38 dwelling units per net residential acre, respectively.

Extensive redevelopment has been proposed in Roxbury. However, the same number of persons now living in areas proposed for redevelopment can be rehoused in project areas once redevelopment is complete.

* Greater Boston Community Council, op. cit., Table III.
Low-density Communities

The following are low-density communities: West Roxbury (7.2 units/acre); Hyde Park (7.6 units/acre); Roslindale (11.4 units/acre); Jamaica Plain (10.6 units/acre); and Dorchester South (16.4 units/acre).

Eighty per cent of the residential buildings in West Roxbury are of the single-family type. Two family dwellings predominate in Hyde Park and Roslindale, while three story structures predominate in Jamaica Plain and Dorchester South.

Summary

The proposed changes in Boston's density pattern concern only high-density communities -- North End, South End, West End, East Boston, Charlestown and South Boston.

The population reductions recommended total slightly over 67,000 persons. Although this is equivalent to an almost 30% reduction from the existing population of these communities, the change is not so drastic as might seem. Each of the communities showed negative population changes between 1920 and 1930 and from 1930 to 1940.* In some cases past population decreases were no less than the proposed decreases. What the proposals herein would accomplish is an accelerated decrease to the proposed stabilization point for each community.

* See Table 1.
TOTAL NEED FOR HOUSING

To bring all communities to their optimum densities, 17,250 dwelling units will be required to accommodate the 67,000 people displaced through rearrangement of the density pattern.

The dwelling unit requirement was computed on the basis of net residential acreage alone. Existing lack of school grounds, recreation space and other community facilities will now be taken into account.

The areas suffering most from lack of community facilities are the high-density areas scheduled for redevelopment. The existing lack will have to be overcome. This will necessitate further decreases in the population of some districts, since community facilities can only be provided at the expense of residential land. These decreases will have to be considered in establishing total housing need. They in no way affect net residential densities.

Boston is well supplied with general community parks, but it suffers from a deficiency of neighborhood recreation areas. In a study made by the Boston Planning Board, this deficiency was established at 190 acres, distributed throughout the city.*

Approximately 40% of the deficiency is in areas not in need of redevelopment and where provision of facilities can be made without displacement of residences. To provide the remainder, about 115 acres, will mean displacement of 5,750 dwelling units, according to an average net density of 50 units per residential acre.

No studies are available to guide a decision on additional re-

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* City Planning Board, Children's Playground in Boston. Boston, November 1948.
ductions required to make up for the present lack of community facilities other than outdoor recreation space. It is assumed that an acreage equivalent to 20% of the acreage needed for outdoor recreation will be required to provide for the other facilities now lacking. This means the displacement of an additional 1,150 residential units.

The total need for housing, therefore, is approximately 25,000 dwelling units.

* * * *

Naturally, housing need had to be computed on the basis of existing population. However, Boston's population has remained fairly stable since 1920, and barring great economic or social upheavals can be expected to remain fairly stable in the future. Therefore, it seems reasonably correct to assume that the population excesses computed can validly be used as a basis for further discussion.

* Percentage suggested by Mr. Peter Nash, Boston Planning Board.*
Part II

AVAILABILITY OF RESIDENTIAL LAND
VACANT RESIDENTIAL LAND
tracts of 5 acres and over

- VACANT TRACTS
1 UNUSABLE - LEDGE
2 UNUSABLE - MUD OR MARSH

SOURCES-
survey by Boston Planning Board - 1946
field surveys by State Hous. Bd. & Boston Hous. Authority
The preceding chapters determined Boston's excess population. Now the availability of land sufficient to house 25,000 families must be determined.

Investigation of the possibility of rehousing these families on land available within Boston, immediately reveals that practically no land suitable to extensive residential development exists.

In 1946, the Boston Planning Board surveyed the city for vacant land in tracts of five or more acres. The purpose of the survey was to locate land that could be used for the construction of veterans' housing projects. Only land zoned for residential uses was mapped.

The Planning Board's survey revealed that less than two thousand acres of land were available for residential construction in Boston. A large portion of this land has since been built upon. Of that which remains -- almost a thousand acres -- nearly two-thirds consists of land situated upon rock ledge (most of this in the Stony Brook Reservation), making development an expensive proposition. The other third is unusable mud or marsh land.*

There are some small tracts of land available in the low-density communities such as West Roxbury, Hyde Park, Roslindale and Jamaica Plain. However, all these tracts are within districts zoned for one and two family residences, and there is little likelihood that they could be rezoned to permit the erection of multiple dwellings.

Local opinion is usually violently opposed to any changes. For

* See map, page 20.
example, the Boston Housing Authority recently requested a change in zoning to permit the erection of multi-family dwellings on a tract near the Arnold Arboretum. Although this is one of the only sizable tracts of land remaining in Boston, and although it was to be used for veterans' housing, the request was denied. Local opposition, expressed at a hearing of the Zoning Board of Appeals, won out. Zoning changes have been thwarted on previous occasions. In a few exceptional cases when this happened, the Housing Authority was forced to build more expensive two-family developments.

Local opposition to amending the zoning regulations could probably be removed if the people could be convinced through a process of democratic education. But even then the problem wouldn't be solved. There is so little land available that it is doubtful that enough housing can be built to accommodate any appreciable number of the units required to reduce densities in the central areas.

***

Since the rehousing of excess population from high-density areas cannot easily be accomplished within the limits of existing residential land and zoning regulations, other solutions must be investigated.
LAND RECLAMATION

CITY LAND CREATED BY FILLING ORIGINAL LAND

SOURCES -
map by Capt. John Bonner - The Town of Boston - 1722
map by John C. Hales - Boston and Environs - 1833
At the present time the greatest land reclamation project within the city of Boston is nearing its end. It was undertaken to bring the old General Edward Lawrence Logan Airport up to standards required by modern air transportation. This filling operation culminates a long history of reclamation in Boston.

The first reclamation project was completed in 1805 with the filling of nine acres of flats. Further land filling took place to increase the city's available building land: Old Mill Cove -- 70 acres; Great Cove -- 112 acres; South Cove -- 186 acres; West Cove -- 80 acres. A tremendous filling operation began in 1857 with the reclamation of the Back Bay. 40 years later, at its completion, another 570 acres had been added to the city. In all, "the filling of tidal marshes and shallow waters has created more than five times as much land as the 783 acres of Boston's original peninsula." But, since the filling of the Back Bay, no large tracts have been created for residential purposes.

In the past, most land reclamation in Boston has been a slow, expensive process. Fill had to be dug out away from the site, brought to the point where it was to be used, and dumped. But with the development of hydraulic dredging, cost and time involved in reclamation of large areas has been greatly reduced. Just as hydraulic dredging has

* I am indebted to the following for technical information contained in this chapter: Logan Airport Engineers, State Division of Waterways, and Boston Port Authority.

# See Map, p. 23

been used to advantage in creating land for industrial, commercial, maritime, and military uses, so might it be employed to create land that could provide housing for Boston's excess population within the city limits.

The Site

Sufficient land to accommodate 25,000 families is needed. To satisfy this need at reasonable densities, 1,000 or more acres are required.

Only two areas meet the size requirement. The first is southeast of Thompsons Island in Boston Harbor. The other is Dorchester Bay. The former was dismissed from immediate consideration because of its relative isolation from the rest of the city.

Dorchester Bay represents a much more advantageous site. It is contiguous to Dorchester and South Boston, and includes the now mostly vacant Cow Pasture. A street pattern can easily be tied in with the surrounding major streets. Old Colony Parkway approaches the site, and Columbia Road skirts it on the western and northern edges. Boston's rapid transit abuts the area in the west.

Slightly less than 20% of the site lies above mean low water, consisting primarily of mud flats. The deepest part of the area lies at 9 feet below mean low water. In conjunction with filling the site by hydraulic methods the channel to the Neponset River can be greatly improved. Plenty of fill will be available from this operation and the deepening of other areas near the site, since fill can be pumped

from as far as two miles away, and excavation can be made to a depth of 45 feet.

To test the practicality of filling Dorchester Bay in order to create residential land for housing excess population, a plan for its development will be outlined.

**Site Reclamation and Costs**

Hydraulic filling is to be utilized in reclamation. It is the fastest and cheapest way to prepare the site. A cover layer of ordinary borrow is applied above the hydraulic fill. A seawall has to be constructed along the shore of the new site. Total cost of site reclamation is approximately sixteen million dollars. Cost per acre of filled surface is $14,000; cost per square foot comes to about 32¢.

The surface of the fill will readily support buildings of four stories or less, with no special construction adaptations required. Taller buildings would necessitate an extensive slab foundation and/or support on piles. It is recommended that no buildings above three stories be constructed on the site (except where it lies on non-filled land.)

**Financing of Land Reclamation**

Land lying below mean low water belongs to the Commonwealth.

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* See Appendix B for technical details and cost breakdown.
# The Commonwealth claims ownership to land below mean low water. However, in connection with the tidelands oil question, the Federal government is now investigating whether it is not the legal owner of such land. Since federal interest is primarily in oil, even if the courts find that ownership belongs to the government, no problem should arise in transfer of title to a local agency for residential
Therefore, with the exception of that part of the Cow Pasture included in the plan, all land will have to be acquired from the state. Since reclaiming the site would serve a public purpose and since the state receives no revenue from the site at the present time, the city is not likely to encounter much difficulty in obtaining rights to the site free of charge.

Federal assistance would not be available for financing the construction of the sea wall and of hydraulic filling operations. Title I of the Housing Act of 1949 specifically refers to "land" whenever allocation of funds is specified. There is no reason to feel that the law could be interpreted so broadly as to include underwater improvements. Federal capital grants would be completely unavailable in connection with this project -- Section 103(a) specifically provides that "the Administrator shall not make any contract for capital grant with respect to a project which consists of open land."

Section 110(c), however, in giving the definition of "project" states "'project' may include (1) acquisition of ... (iv) open land necessary for sound community growth which is to be developed for predominantly residential uses..." Thus, it would be possible to acquire the land through loans authorized under Title I after it has been reclaimed through the use of funds obtained from a source other than the federal government.

Long term loans (up to forty years) are available if the land is to be held by the local public agency and leased out for residential development. Short term loans (up to ten years) can be obtained development of the land. Federal opposition would, likewise, not be encountered in a change of bulkhead and pierhead lines.
provided the land is sold after initial development and improvement.

Loans can also be obtained for the construction of streets, installation of utilities, and construction of public buildings and community facilities necessary to serve the new residential areas.

Write-down of land cost would not be possible under loan financing. It would, however, not be necessary, since the cost of raw land after filling -- 31.8 cents per square foot -- is far below values in existing residential districts having a similar relationship to the central area of Boston and proposed for redevelopment by the Boston Planning Board (min. $1.38/sq.ft. in South Boston and Roxbury; max. $3.50/sq.ft. in South End). Financing charges may, of course, increase the total cost of reclamation, but the favorable relationship in comparison to other land would hardly be affected.

There are two other methods available for financing initial land reclamation. It could be financed by the Commonwealth which has financed creation of large tracts of land in South Boston, and in East Boston for Logan Airport, or through the establishment of an ad hoc agency.

In order for the State to finance filling of Dorchester Bay, however, the General Court would have to pass special legislation. Such action is considered unlikely. State financed projects undertaken in the past were clearly to the benefit of the whole Commonwealth. The development of Dorchester Bay cannot be construed to have state-wide implications.

On the other hand, the legislature could authorize the formation of a public corporation by the city or some other group with the express purpose of undertaking the land reclamation project. Such a corporation
DORCHESTER BAY PLAN
-diagrammatic study

BASE MAP - U.S.C.G.S., 1950, Sheet 246

Soundings in feet at mean low water

MCP THESIS 1950 VICTOR FISCHER MAP OF DORCHESTER BAY AREA
could be modeled after other ad hoc agencies, similar to those that have undertaken turnpike or toll bridge development. The corporation might last only long enough to sell or lease the land to public and private developers.

The agency financing initial reclamation of Dorchester could well realize a profit from sale or lease of land and such profits could be used to develop other lands. It would also be in a position to impose restrictions upon the development of the land to insure proper residential development.

The Plan

Only a very generalized plan is developed here to show what direction the development of the site might take.

Community Recreation

The total area of the site is 1268 acres. A 100 acre recreational development is proposed for the extreme north-east section. In part this is to compensate for the elimination of Carson Beach and a boat anchorage. The new beach is to extend into Pleasure Bay. Existing bathhouses, if worth moving, can be relocated to the new beaches. The new boat anchorage can accommodate more boats than the old one, and would, moreover, provide a sheltered basin. Commercial sight-seeing boats could likewise dock here, and restaurants could serve the visiting public.

The large park to be developed east of the yacht basin could provide active and passive recreation facilities not only for residents of the new community, but also for people elsewhere in the city who do not have direct access to seaside development.
A park strip is projected along the sea wall. This area would be primarily for neighborhood recreation. Green strips connect the seaside park with neighborhoods and the community center.

Community Center

100 acres are allocated for a community center; provisions should be made for the following:

- high school and major playfields
- local governmental offices
- police, fire, health departments
- community shopping center
- churches
- commercial recreation
- auto service
- parking, etc.

Major through streets will account for approximately 48 acres.

Neighborhoods

An average neighborhood density of 24.5 families per acre would be required to house all 25,000 families on the remaining 1,020 acres. (The equivalent net density is 55 families per net residential acre.)

Such densities are difficult to achieve on this site. APHA neighborhood densities applicable are 15.6 families per acre in 2-story dwellings, 19.9 families per acre in 3-story dwellings, and 27.6 families per acre in 6-story dwellings.* While few mechanical difficulties would be faced in erecting 6-story buildings on the Cow Pasture, to do so in other parts of the Dorchester Bay community would be economically

* A.P.H.A., op. cit. Table 14, p. 65.
unjustifiable. It is assumed, therefore, that no more than 2,000 families are to be housed in such dwellings.

The following family distribution by dwelling types may be considered desirable:

<table>
<thead>
<tr>
<th>Proposed dwelling type</th>
<th>Number of families</th>
<th>Neighborhood land area per family</th>
<th>Neighborhood area - Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-story apartment</td>
<td>2,000</td>
<td>1,580 sq. ft.</td>
<td>70 acres</td>
</tr>
<tr>
<td>3-story apartment</td>
<td>11,700</td>
<td>2,195 sq. ft.</td>
<td>580 acres</td>
</tr>
<tr>
<td>2-story apartment</td>
<td>5,850</td>
<td>2,795 sq. ft.</td>
<td>370 acres</td>
</tr>
<tr>
<td>Totals...........</td>
<td>19,500 families.....</td>
<td>1,020 acres</td>
<td></td>
</tr>
</tbody>
</table>

As the table shows only four-fifths of the excess families can be housed on the site at the above densities. Small adjustments in densities may be made to take into account variations from the basic assumptions used in Planning the Neighborhood, but the average density (19.2 families per neighborhood acre) would not be noticeably affected. In other words, the problem of housing the remaining five thousand families has to be solved in a different way or on a different site.

Site Development

The time needed to reclaim the land of the Dorchester Bay site depends entirely upon the resources made available for this purpose. With a large number of hydraulic dredges, the original fill could be placed within a year, and a cover could be applied in a similar period

* ibid., Table 13, p. 65.
through intensive use of trucks and labor. Seawall construction could proceed while filling goes on in other areas. In the inland area residential building could commence within the first year.

There is little reason, however, to rush the completion of filling operations. The development of a community of twenty thousand families could not keep pace with the primary work. Stage development would be necessary. Construction could best commence with higher density residences on the Cow Pasture and in the area south of it. While building resources are concentrated here, primary filling could be completed. Once a road system is laid out, residential construction can follow wherever schedules of the developing agency demand.

Conventional methods of road construction and utilities development can be followed, although some utilities can be laid before final cover is applied. Sewering the community presents no problem — a major sewage pumping station is located at the tip of the Cow Pasture. This station, by the way, does not represent an obnoxious use as the sewage is not emitted until it reaches Moon Island.

**Private-Public**

The need for housing for low-income families has been calculated by the Boston Housing Authority to be 56,933 dwelling units. The BRA has made application for Federal aid to construct 4,000 low-rent units.

* Figure used in application to Public Housing Administration for funds under Title III, Housing Act of 1949. Computed on the basis of substandard housing units, doubling up in substandard units, and temporary war and veterans' housing. This figure does not include displaced families, who are the critical problem since they have to be re-housed before redevelopment.
within the next four years. As can be seen, this makes only a slight dent in the need. However, Boston's share of federal funds available for public housing is greater than the cost of 4,000 units. The only reason that application was not made for a greater number is that there was no land available to build more units!

The Dorchester Bay Plan would make land available for more public housing. The plan would also make it possible to practice equivalent elimination of substandard dwellings and to insure desired density reductions. If slum dwellings are not torn down in equal number to new public housing, outside population pressure might force their continued use.

Public housing, however, should definitely not have a monopoly on the new land; Boston needs private housing as well. The location, and the type of development proposed for the Dorchester Bay site could make it highly desirable to middle- and upper-rental housing. Families ineligible for public housing will be displaced by redevelopment projects, master highway plan developments and other public projects. These could well find a place on the new site. Such an upper income development would also prevent the creation of a super-giant low-income ghetto.

The proportion of private to public housing can not be established here. Thorough study of need and money available would have to precede any conclusion on this subject.

Conclusion

Reclamation of the Bay is feasible, and potentially is a sound investment. If Boston's population densities are to be reduced, it forms the only method by which land can be made available in sufficient
quantity to house a sizable proportion of the excess population within the city limits.
NEW TOWN DEVELOPMENT

The feasibility of land reclamation was investigated in the preceding chapter on the premise that Boston's excess population should be housed within the city limits. Possibly the desired result, the reduction of population densities with its accompanying results, improvement of the physical and social structure of communities, should be achieved through development of facilities outside the city. This possibility will now be considered. The feasibility of developing satellite towns in connection with urban redevelopment will be discussed.

The Satellite Town

Satellite towns are sub-centers in the metropolitan area. Their role is neither one of dependency, nor self-sufficiency. While a majority of its people would be employed in the town itself, the satellite could not be divorced from the metropolitan region. Its people would still be largely dependent upon the central city for providing many of the necessary medical, educational, cultural, and recreational facilities.

Satellite towns may be developed either on completely open land or around the nucleus of an existing town. The major advantage to locating in open country, is that greater freedom in the planning and development of the new town may be obtained. However, existing towns already have a number of basic facilities and services that could form the starting point for development. Also, the existing labor supply would materially aid initial construction. Such factors as these must be considered in site selection. But in the end, of course, site selection has to be
made in view of special conditions existing in each site under consideration.

One aim of new development should be the establishment of balanced communities. To have a sound community, a representative cross-section of the population is desirable, with no groups forming an extremely high proportion in the community. Diversification should exist in population, industry, and commerce. Every effort should be made to obtain a mixture of economic, social and ethnic groups among new town inhabitants.

Diversification in industry and commerce is important to provide new towns with a relatively stable economic base. Employment should be available locally for a majority of the town's labor force. In some cases it may prove advisable to provide industrial estates to accommodate incoming industries.

Town development should be planned to permit balanced community life at any stage of development. Should economic conditions make it necessary to halt construction for extended periods during the overall development, it should be possible to do so without negating what has been achieved up to that point.

Certain factors, such as the reluctance of central cities to lose population, the hesitancy to accept satellite development on the part of towns where such development might be scheduled, and the difficulty of financing such an undertaking, will have to be reckoned with in advance of any new town program.

**Population Reduction in Central Cities**

New town development can make possible not only the redevelopment of slum areas in Boston, but also the redevelopment of several areas
around Boston. Similar problems of over population previously shown to exist in certain areas of Boston, exist in Cambridge, Chelsea, Everett, Revere and Somerville. Like Boston these cities suffer from lack of land necessary to permit resettlement of people from redevelopment areas and make possible a reduction of densities. Satellite development, therefore, may help to eliminate their excess population and thus aid the redevelopment of all these cities.

Before any sizable population reductions that will permit the redevelopment of overpopulated cities can be made, these cities must agree to the loss of some of their population. Such agreement may be difficult to obtain.

In most cases, a decrease in population will be accompanied by a decrease in the tax base of the city. This is a serious matter for the city. It means that not only does the city have to appropriate funds to help redevelop an area, but it must also expect to lose part of the tax income formerly derived from that area.

The reduction in the amount of taxable property, however, would be partly made up by a decrease in the cost of municipally supplied services for that particular area. Most urban redevelopment will occur in areas now subject to a great tax deficit, i.e. the taxes collected by the city from properties in the area fall short of the cost of fire, police, health, and other services which the city has to supply. Improvements in health and safety conditions, which can be achieved through clearing existing slums, can go far towards reducing tax deficit.

Lack of available housing and residential land to accommodate families displaced from redevelopment project areas can substantially slow down the process of redevelopment. But time is an important factor.
The slum areas will demand an increasing proportion of service costs with continued deterioration of dwellings and whole neighborhoods.

Non-economic reasons may also have a bearing on reluctance to approve a population reduction. Loss of population by a city is generally regarded as a sign of weakness and decay, and a city may react against such loss of status. A weakening of a city's political position and a decrease in legislative representation through a large population reduction are possible, and could further weigh against approval of any reduction in population.

It is likely that a large number of the people from redevelopment areas could be induced to move out of Boston or the other central cities, provided proper accommodations and job opportunities can be supplied in the satellite town. Life in the new town would not only be highly attractive to these people by offering them a city environment with country amenities, but it would also provide the individual with a high degree of economic security. Coordination of industrial development with the settlement process of the new town will provide maximum job opportunity for the incoming worker. For potential new town residents, many of whom had long suffered under uncertainty about future employment, the vision of employment security could be a deciding factor in moving to the new town.

Local Agreement to New Town Development

Agreement to satellite town development is further necessary on the part of the town in which the satellite is to be located.

Since all land in Massachusetts is incorporated, any satellite development would have to take place within the boundaries of an established
governmental subdivision. While the state legislature could constitutionally separate a portion of one or more towns, and set it aside for creating a new town, traditionally boundary changes do not take place without approval on the part of the parties involved. Therefore, whether an entirely new town is established, or whether satellite development occurs within an existing town, town agreement to such development is essential.

The possibility that such agreement might be difficult to obtain should not be overlooked. In many cases, the people of a town would prefer to preserve a traditional small-town atmosphere, rather than expand into a more developed population center. People may feel that with expansion their social structure will be lost and their autonomy jeopardized. On the other hand, a segment of the population would probably favor the town's assuming a more important role in the region.

Opposition could well be expected from the group in power in the town and from some of the town's "important" citizens. To these people the influx of a large number of people could mean the abrogation of their present high status in the community. The political composition of the town could very easily change. Business men, now powerful because of their proportionate importance, may lose their position with the development of other, and larger business establishments. Many businessmen, however, can be expected to favor new town development. To them it would mean an expansion of business caused by new markets brought into the town. Many real estate operators and land holders could derive direct benefit from large scale developments. These would also be able to provide employment for large segments of the existing populations.

Opponents of new development might attempt to make a case by
arguing that large residential development would entail greatly increased municipal costs for services, much of which would initially have to be borne by the existing population. This argument is highly invalid. Provision of any new municipal services could be financed through bond issues to the repayment of which the new population would make its proportionate contribution.

Towns in poor economic condition are most likely to approve new town development. Such towns would welcome the revitalization which an influx of population and industry would bring. However, from the standpoint of furthering the success of a new town, it would be more desirable to locate in an economically sound community. The condition of a town may prove very important since industries and commerce may not wish to locate in a place that has been declining in the past.

... 

Generally, special local conditions will be the final determinants of local approval or disapproval of new town development in a community.

For the purpose of further discussion, it will be assumed that local opposition can be surmounted, that approval of development can be obtained. Now the question is, are there practical methods of implementing satellite development?

Direct City Action

Those most immediately involved in a population shift from the central cities to a satellite town are the central cities themselves. It is therefore necessary to determine whether Boston, either alone, or in conjunction with some of the other overpopulated cities, could under-
take the establishment of a new town to which excess population could be transferred.

The development of a new town would constitute a tremendous financial venture. It has already been pointed out that central cities may object to satellite development because potential economic loss is involved. It is, therefore, very unlikely that Boston or the other cities would be willing to agree to finance the relocation of population, loss of which will cost the city money through a decrease in the amount of taxable property. Not only would they not be willing, but the cities would not be able to bear the financial burden which such large-scale development would entail.

Boston and the other central cities, therefore, cannot be expected to make any contribution to the development of a satellite town.

State Action for Satellite Development

A state does not lose its responsibilities to a community with the delegation of powers to that community. It remains the state's duty to supervise and insure proper local development. In line with this function, the state of Massachusetts has passed urban redevelopment enabling legislation, and is considering granting aid to cities to help them meet their proportionate share of redevelopment costs. It may, therefore, be considered that aiding cities in the solution of relocation problems that arise in connection with redevelopment (in this case through new town development) would likewise fall within the scope of state action.

At this time, state agencies have few powers that could be applied towards new town development. Those that would relate to such development are distributed among a series of individual agencies.
The State Planning Board is in a position to undertake surveys and the preparation of preliminary plans for a satellite development. A revival of the metropolitan planning section of the Board could well be directed towards this purpose. Preliminary planning work would include study of sources of population for new towns, survey of potential sites in the metropolitan area, and determination of the desirable economic structure of the new town. The Massachusetts Development and Industrial Commission could aid in the latter phase of the work. It would also be in a position to aid the establishment of industries in the satellite when the town is ready to receive them.

The State Housing Board would be in a position to carry out certain phases of the development program. The Housing Board controls both urban redevelopment and public housing in the state. Enabling legislation permits it to construct housing directly anywhere in the state, although this power has never been applied. The Board has no authority for direct urban redevelopment or development.

While the State Housing Board only supervises receipt of federal housing funds by localities, it can allocate funds to municipalities for the construction of veterans' housing. It can reasonably be expected that state funds would be made available for veterans' housing within a satellite town.

The above powers are completely inadequate to make the development of a new town possible. Extensive special legislation would be required to fill the gaps in the powers presently available. New legislation would have to provide for the establishment of a special development agency, or expansion of the scope of operations of existing redevelopment

*Massachusetts General Laws, Chapter 121, Section 24. See Appendix C, 1.
agencies (i.e. housing authorities) to permit well coordinated development of a satellite town. While housing authorities now can assemble land for redevelopment projects, land assembly will have to be authorized on a broader scale than is involved in land acquisition for housing or slum clearance purposes only.

To make the development of a new town feasible, the state would have to authorize funds to cover losses bound to ensue from the creation of a new town. It is not possible here to estimate potential losses, most of which will be due to provision, within a relatively short time, of entirely new street, water and sewerage systems, and development of extensive community facilities. However, there is little question but that such losses would mount up substantially. To some extent, losses could be reduced if the developing agency acquires all land in the new community and then sells or leases it to private developers at a substantial profit.

Is it likely that the state would permit land speculation, and even construction of commercial and industrial property for lease, by a developing agency? And if not, is it likely that the state would appropriate enough funds to cover any losses?

The answer to both questions is no. The concept of government ownership of land for non-public uses is still far from being accepted in this country. It would be practically impossible for the legislature to provide for government ownership of land, in view of its direct clash with private enterprise. Large-scale governmental, commercial and industrial development would be considered an even more flagrant

* The Greenbelt towns, Oak Ridge, and other federally developed towns constitute special instances of government ownership and construction of communities.
violation of private enterprise rights.

State appropriation of large funds to cover losses incurred in town development could likewise not be expected. Such an appropriation would mean the expenditure of a tremendous sum of money for a special purpose and a special group in one special locality. Politically such action would be completely unacceptable. It can hardly be expected that representatives from all over the state would be willing to spend their constituents' tax contributions for such a localized project.

**Federal Aid to Satellite Development**

The Housing Act of 1949 establishes the realization "of a decent home and a suitable living environment for every American family" as the national housing goal. To implement this goal, two closely related goals are established: (1) housing production and related community development sufficient to remedy the serious housing shortage, and (2) the elimination of substandard and other inadequate housing through the clearance of slums and blighted areas.*

The creation of new towns for the purpose of reducing excess population in cities, so as to permit them to engage in urban redevelopment, would certainly fall within these goals. The primary purpose of this Act, however, is the elimination of slums and the construction of public housing. The tools for implementing the goals provided in Title I of the Act are, therefore, restricted to use in conjunction with redevelopment and development of slums and blighted areas.

While new town development would indirectly aid redevelopment in

many phases, the only direct tie would be the resettlement of families from redevelopment areas.

Federal aid could, therefore, fill only some of the gaps in aid and legislation needed to make new town development possible. Specifically, loan funds under Title I would be available "for the assembly, ... preparation, and sale and lease of land." Further loans (short term) can be obtained "for the provision of public buildings and facilities necessary to serve or support the new uses of land." Aid can also be received for the preparation of surveys and plans in connection with the development of land earmarked for settling displacees from central redevelopment areas.

Under Title III of the 1949 Housing Act, help in construction and operation of low-rent public housing can be received. This housing would not have to be restricted to families from central slum-clearance projects, but would be open to those who meet income limitation clauses.

While allocation of funds for redevelopment and for low-rent public housing is usually made on the basis of need within an existing community, a new town would be eligible for receipt of funds. The major factor would be the establishment of need on a metropolitan basis, with calculations of potential need in the new town. In Sec. 101 (b) the Housing Act specifies that operation of public agencies "on a State, or regional (within a State), or unified metropolitan basis" be encouraged. The new town development agency (be it organized on a local, metropolitan or state level) should therefore have little difficulty in obtaining federal development and housing funds.

* Ibid., Sec. 102 (a).
† Ibid., Sec. 102 (b).
** Ibid., Sec. 102 (d).
It is important to note that equivalent elimination of slum dwellings in central cities can be carried out in conjunction with the construction in a new town, of low-rent public housing for families relocated from redevelopment areas. The Housing Act clearly states that equivalent elimination does not necessarily have to be carried out on the basis of low-rent housing being constructed within the same locality. The two factors can be balanced out on a metropolitan basis.* Cooperative agreements between the municipality and the local housing authority still do not carry such a provision, but it is believed that conformance with federal law could easily be obtained.

The possibility of equivalent elimination of slum dwellings on a metropolitan basis is particularly important because elimination is required with the construction of low-rent public housing. Were it not possible to spread elimination over the metropolitan area, public housing could not be constructed in a new town since there are no slum dwellings to eliminate within the town.

***

No direct aid for the development of a new town, other than that outlined, can be immediately expected from the Federal Government. As previously mentioned, local development is primarily a problem of state concern and jurisdiction, and it is unlikely that Congress would be willing to pass new town legislation, similar to that of Great Britain, which would encroach further on state prerogatives.

Feasibility and Desirability of New Town Development

The creation of new satellite towns could aid the redevelopment of central cities by draining population out of areas scheduled for redevelopment. However, the discussion in this chapter points that such development cannot be expected in the near future.

While some of the individual obstacles to new town development may be eliminated, the overall problem of obtaining funds to finance the development cannot be resolved. Neither municipal, state, nor federal money is available to undertake such a tremendous project. Private capital would not be in a position to underwrite such a venture. Likewise, legislative authorization of expenditures for the establishment of a complete new town is considered unlikely for many years to come.

However, even if development of a new town were economically feasible at this time, it would be undesirable to undertake such a project. Development would, by necessity, have to be closely coordinated with urban redevelopment in Boston and the other overpopulated cities. The population for the new town would, therefore, stem largely from slum clearance areas in these cities. A town characterized by a completely homogeneous population is economically and socially unsound and should be avoided.

It is therefore concluded that the development of a new town in the Boston metropolitan area would be both unfeasible and undesirable at this time.
SUMMARY STATEMENT

The central problem of this thesis has been — Can redevelopment reduce population densities? By an analysis of existing and desirable population densities and the study of the means of housing excess population, the author concludes that through redevelopment a decrease in the density of presently overcrowded areas in Boston can be achieved.

Redevelopment presents Boston with the opportunity of changing the character of its central, overpopulated areas. The change should be accompanied by a reduction in residential densities and the development of neighborhoods with dwellings that make for optimum family and community life.

Reduction of residential densities would entail a displacement of close to 100,000 persons from Boston's central areas. Due to the lack of available land, these people cannot be rehoused in existing residential areas in Boston.

Two methods that might make resettlement of the excess population possible were studied — land reclamation and satellite town development. The first method involved the filling of Dorchester Bay to create new residential land. This undertaking is considered economically feasible. It could solve the problem of reducing the number of people in high-density areas by rehousing them within Boston and would constitute an economic gain for the city. The second method, the development of satellite towns intended to drain excess population from Boston and other central cities in need of redevelopment, was found economically not feasible and socially undesirable at this time.
APPENDIX
<table>
<thead>
<tr>
<th>Community</th>
<th>single family</th>
<th>two family</th>
<th>multi family</th>
<th>local business</th>
<th>general business</th>
<th>industry</th>
<th>rail-road</th>
<th>unrestricted</th>
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<tbody>
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<td>1.8</td>
<td>124.4</td>
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</table>

All figures in Acres.

Source: Boston City Planning Board, 1935.
APPENDIX B

DORCHESTER BAY PLAN

(Technical data and costs.)

Hydraulic Fill

1. Surface has to be brought to 18' above mean low water:

Total surface area of fill ................. 5,602,000 sq. yds.
Low mean water to 18' above ................. 6 yds.

Volume of hydraulic fill .................... 33,612,000 cu. yds.

2. To fill from sea bottom to mean low water the following fill is required; (soundings from U.S.C.G.S. map number 246, March 27, 1950.)

<table>
<thead>
<tr>
<th>Depth from mean low</th>
<th>Surface area in square yards</th>
<th>Volume of fill in cubic yards</th>
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<tr>
<td>1'</td>
<td>793,000</td>
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<tr>
<td>2'</td>
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<tr>
<td>3'</td>
<td>471,000</td>
<td>471,000</td>
</tr>
<tr>
<td>4'</td>
<td>970,000</td>
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<td>5'</td>
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<td>6'</td>
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<td>7'</td>
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<td>8'</td>
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<td>917,000</td>
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<tr>
<td>9'</td>
<td>245,000</td>
<td>735,000</td>
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</table>

Total volume of fill ....................... 5,953,000

3. Total amount of hydraulic fill necessary to bring level of fill to 18' above mean low water .................. 39,565,000 cu. yds.
4. Hydraulic fill has to stand 3 to 6 months. During this time it will settle about 2'. The fill will dry down to the mean high water line (approximately 9.3' to 9.7' above mean low.) Fill consists primarily of silt clay, and dries to an extremely solid crust, which will amount to approximately 6'.

5. Cost of hydraulic fill in a large-scale operation such as this is $.21 per cubic yard.

**Borrow Fill**

1. A 2' cover of ordinary borrow has to be laid on top of hydraulic fill after it dries. Borrow has to be trucked in for distances above 20 miles.

2. Total volume of borrow: depth of fill (2') x surface area of fill (5,602,000 sq.yds.)............................ 3,753,340 cu.yds.

3. After borrow is in place, construction can start.

4. Borrow costs $1.50 per cubic yard.

**Retaining Wall**

1. A retaining wall is required along the 11,000' of shoreline of the new site.

2. Wood bulkhead is cheapest at $60. per running foot. Lifespan of such a seawall is only around 20 years, at which time it would have to be rebuilt. Use not recommended.

3. Steel bulkheads are approximately $75. per running foot. Life span is also short, and use is not recommended.

4. Masonry on pile is almost permanent. Wood piles are driven in, and a wood platform is constructed at mean low water level. The wood will
not rot so long as it is always under water. An 18' high masonry wall is built on top of the platform -- 8' thick at the base, 3' at top. Cost -- $150 per running foot. Use of this type retaining wall is proposed.

Cost of Primary Development

<table>
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<tr>
<th>Cost item</th>
<th>hydraulic fill</th>
<th>borrow fill</th>
<th>retaining wall</th>
<th>TOTAL</th>
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<tr>
<td>Amount of item</td>
<td>39,565,000 cu.yds.</td>
<td>3,753,340 cu.yds.</td>
<td>14,000 feet</td>
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<td>Per unit cost</td>
<td>$0.21 per cu.yd.</td>
<td>$1.50 per cu.yd.</td>
<td>$150 per runn.foot</td>
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<td>Total cost</td>
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<td>Cost per square foot of surface - 50,409,000</td>
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<tr>
<td>Cost per acre of surface - 1,157.2 A.</td>
<td>$7,200.00</td>
<td>$4,900.00</td>
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Appendix C

1. **Powers of State Housing Board:** "The housing board may, with the consent of the governor and council, take by eminent domain or purchase on behalf of and in the name of the commonwealth tracts of land for the purpose of relieving congestion of population and providing homesteads or small houses or plots of ground for mechanics, laborers, wage earners of any kind, or others, citizens of the commonwealth and may hold, improve, subdivide, build upon, sell, repurchase, manage and care for such land and the buildings constructed thereon, in accordance with such terms and conditions as it may determine." -- Massachusetts General Laws, Chapter 121, Sect. 24.

2. **Equivalent elimination of slum dwellings:** "The Authority shall not make any contract for loans or for annual contributions or for federal grants pursuant to this Act with respect to any low-rent housing project initiated after March 1, 1949, unless the governing body of the locality involved has entered into an agreement with the public housing agency providing that, subsequent to the initiation of the low-rent housing project and within five years of the completion thereof, there has been or will be elimination...of unsafe or unsanitary dwelling units situated in the locality or metropolitan area substantially equal in number of newly constructed dwelling units provided by such project." -- Housing Act of 1949, Sec. 307 (2)(d).
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Massachusetts Federation of Taxpayers Associations, Massachusetts Laws Affecting Municipal Government. Boston, 1945. (Supplement 1945.)

Massachusetts General Laws, Chapter 121. (Housing Authority Law.)


