DEVELOPMENT PLAN

FOR

THE PINE TREE BROOK WATERSHED
(WEST MILF ON)

MILTON, MASSACHUSETTS

by

Robert Jackson Bartels
A.B., University of Illinois (1941)

SUBMITTED IN PARTIAL FULFILLMENT OF THE

REQUIREMENTS OF THE DEGREE OF

MASTER IN CITY PLANNING

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

(1950)

Signature of Author_

Certified by__ Head, Department of City and Regional Planning
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Plate 11 is not included in the Archives copy of this thesis. Please see attached note on page 82A.
145 Spring Street
Lexington 73,
Massachusetts
October 27, 1950

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

Dear Mr. Adams:

In partial fulfillment of the requirements for the degree of Master in City Planning, I submit this thesis entitled "Development Plan for the Pine Tree Brook Watershed and the Western Section of Milton, Massachusetts."

Respectfully,

Robert J. Bartels
Dedicated to my sons, Andrew Hudson and Jonathan Henry.
Without them planning would have been twice as easy-
but only half as meaningful;
and to my wife, Jane.
ACKNOWLEDGEMENTS

The author expresses his appreciation for advice and technical assistance furnished by Harold M. Turner; John W. Raymond, Jr.; Professor William E. Stanley; Alexander R. Manning, Milton Town Engineer; the Milton Planning Board; and Professor Roland B. Greeley. It was previous work of Mr. Turner, plus his understanding cooperation, which alone made the key section of flood control possible. However, neither Mr. Turner nor any other of the technical men mentioned are in any way responsible for the derived plans.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INTRODUCTION</strong></td>
<td></td>
</tr>
<tr>
<td>The Watershed in Relation to Milton</td>
<td>1</td>
</tr>
<tr>
<td>Justification of Planning Area</td>
<td>3</td>
</tr>
<tr>
<td><strong>PLANNING SURVEY OF THE PINE TREE BROOK WATERSHED</strong></td>
<td></td>
</tr>
<tr>
<td>WEST MILTON</td>
<td>6</td>
</tr>
<tr>
<td>Pine Tree Brook: Its Functions and Problems</td>
<td>6</td>
</tr>
<tr>
<td>Topography</td>
<td>7</td>
</tr>
<tr>
<td>The Pattern of Development, Existing Land Use</td>
<td>7</td>
</tr>
<tr>
<td>Population and Economy</td>
<td>11</td>
</tr>
<tr>
<td>Survey - Housing</td>
<td>15</td>
</tr>
<tr>
<td>Utilities and Drainage</td>
<td>19</td>
</tr>
<tr>
<td>Streets and Traffic</td>
<td>21</td>
</tr>
<tr>
<td>Schools</td>
<td>24</td>
</tr>
<tr>
<td>Recreation</td>
<td>25</td>
</tr>
<tr>
<td>Shopping</td>
<td>26</td>
</tr>
<tr>
<td>Transit</td>
<td>28</td>
</tr>
<tr>
<td>Other Town Facilities in West Milton</td>
<td>29</td>
</tr>
<tr>
<td>Planning, Organization and Operation</td>
<td>30</td>
</tr>
<tr>
<td>Summary of Problems</td>
<td>30</td>
</tr>
<tr>
<td><strong>DEVELOPMENT PLAN</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>32</td>
</tr>
<tr>
<td>Floods and Flood Control</td>
<td>32</td>
</tr>
<tr>
<td><strong>REGIONAL EXPRESSWAYS &amp; PARKWAYS</strong></td>
<td></td>
</tr>
<tr>
<td>Expressways</td>
<td>52</td>
</tr>
<tr>
<td>Regional Parkways</td>
<td>58</td>
</tr>
<tr>
<td>Community Pattern</td>
<td>59</td>
</tr>
<tr>
<td>Land Use</td>
<td>60</td>
</tr>
<tr>
<td>TABLE OF CONTENTS (CONTINUED)</td>
<td>Page</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Schools</td>
<td>63</td>
</tr>
<tr>
<td>Neighborhood Recreation Facilities</td>
<td>65</td>
</tr>
<tr>
<td>Community Recreation Facilities</td>
<td>68</td>
</tr>
<tr>
<td>Shopping</td>
<td>68</td>
</tr>
<tr>
<td>Tucker School Neighborhood</td>
<td>69</td>
</tr>
<tr>
<td>Turner's Pond Neighborhood</td>
<td>69</td>
</tr>
<tr>
<td>Pope's Pond Neighborhood</td>
<td>70</td>
</tr>
<tr>
<td>Vose School Neighborhood</td>
<td>70</td>
</tr>
<tr>
<td>Streets and Traffic</td>
<td>71</td>
</tr>
<tr>
<td>Brook Road</td>
<td>72</td>
</tr>
<tr>
<td>Reedsdale Road</td>
<td>72</td>
</tr>
<tr>
<td>Canton Avenue</td>
<td>73</td>
</tr>
<tr>
<td>Randolph Avenue</td>
<td>73</td>
</tr>
<tr>
<td>Central Avenue</td>
<td>73</td>
</tr>
<tr>
<td>Thacher Street</td>
<td>74</td>
</tr>
<tr>
<td>Blue Hill Avenue</td>
<td>74</td>
</tr>
<tr>
<td>Blue Hills Parkway</td>
<td>74</td>
</tr>
<tr>
<td>Elliot Street</td>
<td>75</td>
</tr>
<tr>
<td>Proposed Pine Tree Brook Parkway</td>
<td>75</td>
</tr>
<tr>
<td>Community Facilities</td>
<td>76</td>
</tr>
<tr>
<td>Development of the Reservoir for Town and Metropolitan Recreation</td>
<td>76</td>
</tr>
<tr>
<td>M.D.C. Use</td>
<td>78</td>
</tr>
<tr>
<td>Other Town Facilities in West Milton</td>
<td>80</td>
</tr>
<tr>
<td>Utilities</td>
<td>82</td>
</tr>
<tr>
<td>Transit</td>
<td>82</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS (CONTINUED)

<table>
<thead>
<tr>
<th>Appendix A</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Computations, Reservoir Plan</td>
<td>83</td>
</tr>
<tr>
<td>Appendix B</td>
<td></td>
</tr>
<tr>
<td>Cost of Reservoir</td>
<td>85</td>
</tr>
</tbody>
</table>
INTRODUCTION
INTRODUCTION

The Watershed in Relation to Milton

Pine tree brook is a very small stream. From its sources in the Blue Hills to its mouth at the Neponset River is a direct distance of only five and one half miles. To the town of Milton, however, the brook is of major importance. Three-fifths of the town is drained by the brook; (Plate 1) and its floods menace important public and private installations. The special problems of the watershed are such as to demand specific and coordinated planning and the effectuation of such plans will require aggressive and coordinated action. Because very little of the stream lies outside the town boundaries, the town has, for all practical purposes, complete jurisdiction over its water. This fortuitous situation is made even more favorable by the fact that virtually all of the watershed lying outside of the town is in the Blue Hills Reservation and consequently protected from development. The town therefore has the not too common opportunity of combining complete watershed planning with the other phases of planning without the necessity of coordinating its controls with any of the other municipality.

It will be noted from Plate 1 that Pine Tree Brook drainage area covers virtually all of Milton lying west of Randolph Avenue plus some areas to the East. The lands to the west of the Avenue that are not included in the watershed are very closely related to it and must be planned
PINE TREE BROOK
DRAINAGE AREA

COVERS THREE-FIFTHS OF MILTON
concurrently. These areas have no special problems which would call for treatment separate from the watershed planning and, for schools and other public and social functions, are inseparable from the land in the watershed. With minor exceptions, however, the Eastern boundary of the basin falls in a division area between the part of the town which centers on East Milton and the remainder of the community.

This part of Milton, which does not focus on East Milton, and is drained primarily by Pine Tree Brook, may be thought of as "West" Milton. The concept of West Milton derives perhaps as much from its separation from East Milton as from any cohesive forces in the area. East Milton is a tightly knit community, readily recognizable and conscious of its own individuality because of its centralized activities. Its one central shopping center serves as a governmental sub-center and a commuting and social center. It has its own post office, library, fire house, and array of churches. Approximately the same Milton Area served by these facilities is also served by the Cunningham Junior High School and the large Cunningham Park. In addition to having its activities centered around this nucleus, East Milton is to an important extent physically separated from the rest of the town by the large land masses occupied by Milton Cemetery and Milton Academy.

West Milton, on the other hand, has no such center. While there are some influences that act as unifying forces, there are others which are disruptive. The one junior high
school which serves the area is a unifying factor, although its effect is considerably mitigated by its incorporation into the same physical plant as the town high school. The organization of churches and the commutation pattern are also unifying factors.

The centrifugal forces acting on the community are perhaps stronger. Shopping is done at three different places on the periphery of the town; municipal facilities are scattered without relation to each other; and rapid transit commuting, while on the same line, is divided among many different stations.

**Justification of Planning Area**

Preparation of more precise plans for a portion of a municipality cannot be justified without the existence of at least a generalized Master Plan for the entire political area. While Milton does not have an officially adopted Master Plan, the Milton Planning Board, starting under the aegis of the late Professor Henry V. Hubbard of Harvard, has worked for many years on various phases of planning, and has developed certain generalized ideas that taken together serve as a sufficient framework for more exact planning.

The most important of these Master Plan ideas concerns land use planning. The general scheme of land use was set for the town as early as 1925 when the first zoning by-laws were adopted. The pattern has been highly restrictive.
Industrial areas have been kept to a minimum, commerce has not been encouraged, and dwellings have been limited to single family units. Later zoning changes were even more restrictive, and created residential areas of low density; 1/2 acre and 1 acre per family. There is no question of highly vocal public support for these restrictions on private land use.

A study prepared for the Planning Board in 1941 by Arthur Comey and Betty Fullerton indicated that the town could operate with financial success as a successful bedroom suburb only by encouraging more expensive residential development and limiting less expensive. That policy has become a fixed tenent of planning.

Plans prepared for the Planning Board during World War II have indicated the desirability of establishing new shopping facilities in the area of the Town Center.

Public land use has also received considerable attention from the Planning Board. Plans for recreation facilities have been prepared for the board. The School Board has drawn up its own tentative plan for schools and school sites.

The Planning board has also given considerable attention to highway planning, and has gone on record in favor of express-way construction to ease the pressure of through traffic on the town.

While much of this planning has been fragmentary and sometimes unrelated, it is enough to furnish a base and a direction for the task at hand.
Planning for West Milton cannot stand independently. The capital improvement needs of the entire town must be assessed, assigned priority, and related to the town's ability to pay in long term capital expenditures programs. A development plan for East Milton, similar in scope and coordinated with this plan, should be prepared so that the two plans might make up a complete master plan for all of Milton that could be the basis for a future action program.
PLANNING SURVEY OF THE
PINE TREE BROOK WATERSHED
(WEST MILTON)
Pine Tree Brook: Its functions and problems

Pine Tree Brook is both problem and opportunity to the Town of Milton. It is a problem because in its present condition it constitutes an ever present flood menace. It is opportunity in that its waters and channels are natural assets; resources of beauty and utility. The waters of the stream, although not needed for human consumption, are sources of recreation and beauty, the potentialities of which have hardly been touched. The same can be said of the undeveloped land along the stream. The channel of the brook serves as a natural storm drain, potentially adequate to the need.

Even in its present unprotected state the brook is responsible for much of the attractiveness and charm of the Western part of Milton. The green of the open area along its banks and the spacious and lovely views provided by Pope's and Turner's ponds, are real assets to Milton. Few Milton people realize how transitory these assets may be. Past encroachment of development on the stream does not auger well for the attractiveness of the remaining undeveloped areas. The stream over a good part of its course has been relegated to back yards, shut off from view by the close development of houses and shut off from public access. As man encroaches more and more on the watershed it is important that the beauty of the stream be retained, and the functioning
of the stream as a storm sewer be improved. The more technical aspects of this problem are reviewed at greater length in the Planning section of this report.

Topography

As stated earlier, the larger part of West Milton is contained in the eight square miles of the Pine Tree Brook Watershed. The brook originates in a number of small tributaries in the Blue Hills. Most of the land in the headwaters area is either too rugged or too swampy to be attractive for close development. Downstream, north of Canton Avenue, the land is generally more level although it rises somewhat steeply toward Brush Hill which forms the western divide. In the broad valley the stream flows slowly, interrupted in its course by ponds and swamps. Closer to the Neponset the topography again becomes more rugged as the land falls off towards the river, and the brook again flows rapidly as it encounters the more favorable gradient.

These and other features of the topography may be seen as they relate to present and proposed development on the Development Plan map, Plate II. The town is very fortunate in having the excellent topographic map used as the base map for this plan.

The Pattern of Development, Existing Land Use

The growth of Milton has been conditioned by its proximity to Boston, and directed as to place by the location of the river crossings. Settlements grew up in early days around Milton Village, (Milton Lower Mills)
where there was an early river crossing; and later around
the bridge at Mattapan. As the town grew it gradually
spread out from those first settlements, thrusting south
along the major highways and later filling in the inter-
stices. Higher land throughout the valley was generally
taken over for estates with the lower land, or the part
of it that was reasonably dry, being more closely developed.

Prior to the enactment of the first zoning by-law in
1925 there had been a considerable number of two family
residences erected in the area close to the Mattapan bridge.
There are also a very few three and four family structures.
All of the houses built since that time however, have been
single family homes.

in 1938 revision of the town zoning by-law divided
the residential area into zones of differing lot sizes.
The minimum lot size requirements for the districts were
7,000 square foot, half acre, and acre. The distribution
of zones was made primarily along the lines of existing
development. (Plate 2). The vacant areas in the 7,000
foot zone were in considerable demand and most of them have
now been utilized. Virtually the only tract still unused
is under and around Turner's Pond, an area which the owner
has expressed himself as being desirous of developing.

New development in the acre and half acre zones has been
less extensive because of the more limited demand. While
there have been many new homes in these areas, most of the
building has been on existing roads. The high front
cost of land development will retard the building of new streets until the supply of larger lots now possessing street frontage is more nearly exhausted.

Commercial and industrial land uses have been virtually restricted to those existing in 1925.

As seen on Plate 11, a large part of the rugged land in the southern end of town has been preserved in natural condition as part of the Metropolitan District Commission's Blue Hills Reservation. Smaller, although still sizeable, areas have been taken for various town uses. The large plot formerly operated as the Town Farm is now leased for private operation.

A considerable and growing land use in the town is for the so-called quasi-public uses. For example, the Boy Scouts of America operate a large tract as a Scout camp and several religious bodies hold large areas as convents or schools.

Farming, largely of the estate variety, still occupies large acreage. Indeed, most of the privately held open land in the town is held as part of estates or farms rather than purely for speculative purposes.

A large tract of land in the southern tip of the town presents a peculiar problem. The tract, in three ownerships, is separated from the rest of the town by the Blue Hills Reservation. By some unfortunate chance this isolated piece was zoned as a 7,000 square foot residential area at the
time of the revision of the zoning by law in 1938. While there has been much talk of changing the zoning or of "giving" the area to Canton, nothing has ever been done.

The owner of one section has now proposed subdivision into 7,000 foot lots. Division of these parcels, or any one of them, into small lots would present the town with heavy expenditures for schools or school transportation; create a serious fire protection problem; and generally strain the town services. Drastic action to prevent such development is called for.

As far as neighboring land uses are concerned, west Milton is protected by adequate buffers from inharmonious land uses in bordering communities in all sectors except the Brush Hill Road area. The sector of Hyde Park which lies just across the border from Milton on Brush Hill must receive attention in planning. This section has been recently built up in duplexes and other close development will undoubtedly exert disintegrating pressures on the fine Milton estates along Brush Hill Road. On the other hand, the estates serve as a green belt between Hyde Park and the more closely developed section of Milton. Attention must be given to the problem of maintaining this greenbelt against all pressures. Plates 3 and 3A show the present uses of land in west Milton.
PLATE 3A

EXISTING LAND USE

PUBLIC QUASI PUBLIC COMMERCIAL LIGHT INDUSTRIAL CLOSE RESIDENTIAL FARMING, ESTATES, & VACANT.

* Heavier pattern indicates areas that are predominantly two family.

MAP OF MILTON MASSACHUSETTS

FORREST J. MAYNARD TOWN ENGINEER
Population and Economy

All physical plans should be linked to the population that is to use the planned facilities. In order to do this most successfully, as complete information as possible must be gathered on the numbers of people; locus of their residences, and such characteristics as family, size, age, and sex. Not only must these be known about the present population, but they should be predicted, as far as possible, for the future.

The most important of these factors is the size of the future population. Population growth is a function of two phenomena, that of the excess of births over deaths, and the excess of in-migration over out-migration. In areas undergoing rapid growth through in-migration the factor of natural increase is secondary in importance. Natural increase in Milton during the 1940s, a decade of unusually high birth rates was only 912 out of a total of 3,687. As the town population ages, and birth rates subside to a more normal level, it is probable that natural increase will become an even less important factor in Milton's population growth.

Future growth, consequently, will depend upon net migration, that is, the number and size of incoming families as related to the number and size of out-going families. In a suburban community such as Milton there is a constant outflow and inflow of population, even without any new housing. While much of this movement consists of the replacement of
one migrating family with another of similar characteristics, other consists of replacing retiring or dissolving families with younger families. This change has been particularly effective lately with the good market for second-hand housing, and is probably to some degree responsible for the large increase in Milton's population in the last decade. In past years, as may be seen from the following table, Milton's population increased at the same time its housing increased but at no dependable relationship. Other factors than the supply of new housing were evidently of considerable importance. The decline of family size, varying amounts of natural increase, and the number of vacant houses at census time were important factors.

Table 1.

<table>
<thead>
<tr>
<th>Decade</th>
<th>Number of New Dwelling Units</th>
<th>Population Income</th>
<th>Population at End of Decade</th>
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<tr>
<td>1890-1899</td>
<td>281</td>
<td>716</td>
<td>6,578</td>
</tr>
<tr>
<td>1900-1909</td>
<td>701</td>
<td>2088</td>
<td>7,924</td>
</tr>
<tr>
<td>1910-1919</td>
<td>2144</td>
<td>7042</td>
<td>9,382</td>
</tr>
<tr>
<td>1920-1929</td>
<td>1267</td>
<td>2278</td>
<td>16,434</td>
</tr>
<tr>
<td>1930-1939</td>
<td>763</td>
<td>3687</td>
<td>18,708</td>
</tr>
<tr>
<td>1940-1949</td>
<td></td>
<td></td>
<td>22,395</td>
</tr>
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Source: Office records, Town Building Inspectors, and U.S. Census of Population.
At present with nearly one hundred percent occupancy of existing housing a condition that is likely to continue for many years, with natural increase on the way to becoming a negligible factor, and with family size fairly well stabilized; future increase will depend almost entirely upon the number of new dwelling units constructed and occupied.

While some idea of the rate of building in past years can be derived from Table 1, those rates are not necessarily applicable to the future.

A definite though not immutable limit to home building in Milton is set by the amount of vacant land available and the controls on the use of that land. In 1947, the State Planning Board computed the number of lots that could be made available for residential development as 2055. 1271 of these were in the acre lot areas, 40 in the half acre and 480 in the 7,000 square feet zone. In 1950, the figures are probably closer to 1200, 375 and 100 respectively; due primarily to the depletion of the supply of vacant lots; but partially to the extension of public and institutional uses. Undoubtedly the 1950 total of some 1700 available lots will be reduced by extensions of public and semi-public uses; and contra-wise increased through zoning liberalization. The net balance of these changes, however, will probably be to increase the potential number of lots. Since it is very unlikely that all of the land will be available, and that it will be divided pre-
cisely into lots of exact zoning size, it is not likely that under any conditions approximating present limitations that there will be as many as 2500 additional residences in the town, and an increase of less than 2000 units seems more reasonable.

Translated into terms of population growth this means a probable population increase from the present 22,395 to approximately 30,000.

There is, of course, more of an effective demand for medium prices houses on lots of a quarter of an acre or less than there is for higher priced houses on larger lots. It is likely that whatever land is made available for the lower priced houses will be used up very rapidly, and that this will be the principle factor determining rate of growth. The larger lot areas will be built up much more slowly unless something is done to give the Milton area even greater advantages for luxury living than it now possesses.

Location of the residences of the some 3700 families living in West Milton at the present time can be seen in Plate 4. It will be noted that most of them are concentrated in the area between Pine Tree Brook and the Neponset River. Existing densities in those areas will undoubtedly continue for the foreseeable future. New development is much less concentrated and spreads out to the south.

Unfortunately, at the time of writing there are no figures on age and sex composition later than those for 1940.
Significant factors revealed at that time were even a predominance of the female sex in the groups over 20, and a greater than normal concentration of older people due in part to the great in-migration in years past. There is no reason to believe there has been any marked change in these characteristics.

Most of the people of Milton work outside the town. In 1947, there were only 61 manufacturing employees working in all of Milton. A limited number of others are employed in trades, services, and government, and at the Milton Academy, but the vast majority are commuters.

**Survey - Housing**

On the basis of condition-of-structure as rated in the 1940 census of Housing, Milton has virtually no physical housing problem. Of the 5,048 dwelling units counted in 1940, only 34 had no private bath or were in need of major repair. While it is probably that some of the two and three family family houses are so close together as to deprive each other of the proper amount of sunshine, the condition is not serious enough to warrant public action in the foreseeable future. It is evident from field inspection that all but a very small fraction of the housing in West Milton, and indeed the entire town, would pass the most severe of present adequacy test. A large part of the housing is superior in quality.

The one serious discrepancy in the housing picture is the lack of medium rental housing. There are no apartments
in town, other than the limited number in two and three family structures, for older Miltonites who would like to give up houses for apartment living in Milton; or for younger Miltonites who would like to make their homes in the town but cannot afford to purchase housing. With the strong feeling against multi-family housing that prevails in the town, however, there is little probability of securing any action to permit new multi-family structures.
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Utilities and Drainage

Water: Potable water is supplied by the metropolitan District Commission trunk system. Upon completion of a storage reservoir in the Blue Hills, the supply and pressure will be adequate at all times and for all foreseeable needs. The local distributive system is owned and operated by the town. In general, the system is adequate; minor improvements and changes that are needed are technical matters which will not affect other planning in the community. The policy of the water commissioners of requiring eight inch minimum size water mains in all new sub-divisions could well be modified to allow six inch mains in low density areas in the outlying sections.

Sewerage: Removal and disposal of sewage is also handled by the trunk M.D.C. system. The local collection system is operated by the Town and is adequate with minor improvements, to the need. The sewers are being extended in betterment streets; and in new subdivisions at the expense of the developer.

Drainage: Except for minor additions and improvements, the storm drainage system is complete and adequate in all of west Milton except the Pine Tree Brook watershed. As will be discussed more fully in the planning section, the brook is inadequate in carrying capacity to meet the storm drainage needs of the watershed. Furthermore, the inadequacy increases every year there is new land development. Steps will have to be taken to alleviate the situa-
tion in the near future.

The general policy of the Town Engineer in installing storm drains has been to enclose existing tributaries in pipe in closely developed areas. In more open development the tributaries as well as the main channels have been left open. It would be well if a definite policy could be arrived at to leave the main channels of Trout Brook and Pine Tree Brook open for their lengths, to leave the tributaries open in acre districts and wherever possible in half acre districts. Water in the open channels will flow less percpitously decreasing flood peaks and the small streams themselves should add considerably to the amenities.
Streets and Traffic

The major road network of the western part of Milton has developed as a series of fan patterns, radiating from the Neponset River crossings at Paul's bridge, Mattapan, Milton Village, and to a lesser extent, the Central Avenue bridge. The radiating pattern cuts the areas near the focii into narrow wedges, making land planning difficult, and the establishment of neighborhoods free of traffic arteries virtually impossible.

While many of the streets were laid out with broad right-of-ways, few of them have remained adequate to handle today's heavy traffic. The right-of-way of some of the major streets are listed below:

<table>
<thead>
<tr>
<th>Street Name</th>
<th>Right-of-Way</th>
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<tbody>
<tr>
<td>Blue Hill Avenue</td>
<td>66 feet</td>
</tr>
<tr>
<td>Brook Road, West of Center Street</td>
<td>80 &quot;</td>
</tr>
<tr>
<td>East of Center Street</td>
<td>100 &quot;</td>
</tr>
<tr>
<td>Reedsdale Road</td>
<td>74 &quot;</td>
</tr>
<tr>
<td>Randolph Avenue South of Reedsdale Rd.</td>
<td>74 &quot;</td>
</tr>
<tr>
<td>North of Reedsdale Rd.</td>
<td>60 &quot;</td>
</tr>
<tr>
<td>Central Avenue</td>
<td>80 &quot;</td>
</tr>
</tbody>
</table>

Although efforts were made to create wide right-of-ways for these above streets to meet future needs other important feeder streets, notably Eliot Street and Thacher Street, were developed with utterly inadequate 40 foot ways. The street system has become increasingly inadequate to serve the heavy volumes of through traffic, causing delay and unsafe conditions for the motorist. Community life has suffered more and more from the disruptive effects of heavy traffic.
In the absence of recent complete traffic counts it is impossible to show the exact amount of traffic on the important streets of Milton. A complete count taken in 1936 under the W.P.A., however, showed the pattern of traffic at that time. This information, when weighted with increases since that time as shown by State Public Works Department counts at a few sites in Milton, gives some idea of the present picture. (Plate 5). This traffic flow map reveals two principle directions of through traffic flow in Milton. One is the North-South movement to and from Boston. The other is the East-West movement of traffic from points North and West of Mattapan to and from East Milton, Quincy, and the South Shore.

State Routes 138 (Blue Hill Avenue) and 28 (Randolph Avenue, Reedsdale Road, Brook Road, and Blue Hills Parkway) together bring nearly 15,000 cars through Milton to Mattapan on an average day. A smaller, though still appreciable amount of traffic from Route 28 continues on Randolph Avenue to Milton village and Dorchester Avenue. The streets traversed by these routes are inadequate to the need, and the traffic is far too heavy to pour through residential enclaves. Since both of the routes are arterial roads to Boston, the situation obviously calls for an expressway type of facility.

The east-West routes are Route 135 (Canton Avenue) which carries some 4,000 vehicles originating West of
Boston, and Brook Road which carries a slightly higher number originating in Boston or communities just to the West. The traffic volumes on each of these roads is, or gives promise of being, large enough to warrant a four lane divided highway. However one such highway could accommodate the traffic from both if it could be concentrated.

On the basis of this information, the principal traffic needs of Milton are the need to remove heavy through traffic from residential neighborhoods and the need to improve local feeder streets. Measures proposed towards this end consist of:

**Through Traffic**

1. Removal of through traffic from Routes 138 and 28 and Randolph Avenue by providing an alternate and better expressway. Slowing up all remaining traffic and discouraging truck traffic on these routes.

2. Taking traffic from Brook Road and Route 135 by providing a better East-West Route across Milton to connect traffic originating North and West of Mattapan with Quincy and the South Shore; slowing down residual traffic.

**Local Collection and Connector Streets**

1. Creation of a street in the Popes Pond area to connect the district West of the Pond with the High School, proposed Junior High School off Canton Avenue and the Town Center.

2. Improving the Thacher Street Collector or providing a substitute for traffic.

3. Relieving of Eliot Street

4. Provision of suitable connections to the proposed lake and recreation area.

5. Decreasing number of traffic arteries crossing neighborhoods.
Schools

At present the Town operates under a 6-3-3 school system with five elementary schools, two junior high schools, and one senior high school. The senior high school building now houses, in addition to the high school, the junior high school serving West Milton. It is probable that when the larger classes now in the grade schools reach junior high and high school age the entire senior high school building will be required for high school purposes. This future need has been recognized by the School Board and adequate land has been purchased near Canton Avenue and Gulliver Street for a Junior High School as well as an authorized grade school. The East Milton Junior High School is of recent construction and adequate.

The school buildings in Milton, their first year of occupancy and normal capacity are as follows:

<table>
<thead>
<tr>
<th>Community</th>
<th>School</th>
<th>Year of Occupancy</th>
<th>Normal Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Milton</td>
<td>Belcher</td>
<td>1894</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td>Collicot</td>
<td>1929</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td>Cunningham Jr. High</td>
<td>1935</td>
<td>500</td>
</tr>
<tr>
<td>West Milton</td>
<td>Vose</td>
<td>1886</td>
<td>385</td>
</tr>
<tr>
<td></td>
<td>Glover</td>
<td>1889</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>Tucker</td>
<td>1924</td>
<td>600</td>
</tr>
<tr>
<td></td>
<td>Central High</td>
<td>1909, 1917, 1926</td>
<td>1000 to 1200</td>
</tr>
</tbody>
</table>

Source: Milton Town Report 149 p. 311

Of the five grade schools only the Collicot School is fully adequate but should have larger grounds.

In West Milton the Vose and Glover schools need re-location as well as rebuilding, only the Tucker School is
well located from a standpoint of service area. The location of the old Vose school was better than that of the new school site chosen to replace it. Present schools in relation to existing and probable future population are shown on Plate 4.

Recreation

Milton has very active public and privately organized recreation and sports programs. It has a good nucleus of recreation fields to handle this activity but the area is not adequate for the needs of the town nor are the fields well enough located to serve all people.

The Brook Road Playground serves as athletic field for Central High and Junior High Schools in addition to American Legion, V.F.W., and other teams. Consequently it is over used and other facilities are required. A 15 acre plot has been purchased adjacent to the new Central Avenue grade and Junior High School site for a playground. This field when completed will take care of the West Milton needs for athletic facilities.

Aside from the athletic field facilities mentioned, West Milton has a good and well used playground on land owned by the School Department on Eliot Street.

Other small areas are available in the Mary C. Lane playground on Randolph Avenue (which is irregular in topography and poorly located in relation to the population to be served) and a small area with very rough terrain also held by the Park Department on Blue Hill Avenue near Decker
Street. This latter land is unsuitable for organized recreation.

A considerable population west of Blue Hill Avenue and another group south of the new hospital are too far away from the playgrounds to be adequately served.

Shopping

There are two shopping centers on the edge of West Milton and a few other stores scattered throughout the area. The two centers, one at the Central Avenue bridge, and the other at Milton village, might almost be considered as one since they are but little more than a quarter of a mile apart. The shopping center at Central Avenue is purely a neighborhood development with the following stores and services:

- Restaurant and Ice Cream Bar
- Beautician
- Small chain grocery
- Optician
- Grocery
- Drugs
- Dress Shop
- Barber
- Cleaners
- Variety
- 2 Gas stations
- Automobile dealer

Milton Village, on the other hand, is something more than a neighborhood center. In addition to a few neighborhood type facilities, there are two banks, two appliance stores, and a few offices and club meeting rooms. However, it is not a thriving center. There are empty stores in the block and there have been no recent remodelings or new building.
The commuting stop, the employment centers at the Telephone exchange, the Baker's Chocolate mills, and the banking facilities have enabled the area to survive but have not been enough to insure prosperity. Less than 300 families live within a half mile radius on the Milton side and most of them are closer to Central Avenue shopping. Fewer than 1,000 families live within a mile. The location of the village, on a steep hillside and astride a major traffic artery, is a further deterrent to successful development.

West Milton, an area with some 3,700 above average income families is thus without a modern shopping center and does not even have a modern super market.

Most of the shopping for the area, other than that done in central Boston or Quincy, is carried on across the river in Mattapan. Some 600 Milton families live within a half mile of Mattapan and over 2,500 families live within a mile. Mattapan, a large established center with more than a mile of shopping frontage, offers an array of goods and services that no Milton center could hope to rival. While Mattapan is beset with parking and congestion problems, the difficulties are by no means of such a character as to cause deterioration of the area or to defy solution and traffic conditions there should be greatly relieved by the proposed expressways.

Existance of the flourishing Mattapan center makes the creation of a central West Milton shopping center impractical.
Although a community shopping center seems unlikely, the recent development of areas 3/4 to 1 1/2 miles beyond Mattapan (areas with little or no existing shopping facilities of any kind) creates a very favorable situation for establishing successful neighborhood shopping centers in those outlying areas.

The Central Avenue center will require some treatment to provide safer traffic conditions and better parking. It is the opinion of the author that the Milton village center is largely anachronistic, and that changing patterns have, and will still further, reduce its important to the community as a shopping center. It still retains certain utility to the surrounding business uses, however, and should remain at the present, or a slightly reduced, size.

**Transit**

Most public transportation facilities in Milton are directed towards the task of delivering commuters to central Boston. The trolley running along the Neponset on a former railroad right-of-way connects with the regular rapid transit system at Ashmont Station to form the principle route. The trip from Mattapan to Park Square is advertised as a short 27 minutes. A growing number of commuters living more than an easy walking distance from the stations on the line must take a separate bus to the station, drive, or be driven. As such trips now require three changes before reaching destination, it would be highly desirable from the commuters stand-
point if at least one of the changes could be eliminated.

An additional bus line provides cross town service on Canton Avenue although infrequent headway, a situation that can be expected to improve as the population of the outlying areas is built up.

Other Town Facilities in West Milton

The Town Hall, town offices in the Thacher building, and the headquarters Fire Station, are very well located with relation to the distribution of the Town's population. The Town Police Station on Central Avenue is not as well located and should be consolidated with the other services in the Town Center.

The main Town Library opposite the Town Hall, and a branch near Tucker school on Blue Hills Parkway, provide library service for the community. Undoubtedly wider use of library service would come through additional libraries in the area. There is a considerable need for one in the Pope's Pond area, and another in the neighborhood of the Central Avenue Shopping Center.

Engine House Number 4 at the corner of Blue Hill Avenue and Atherton Street together with the Headquarters Station, gives complete coverage and satisfactory fire protection.

The Town Public Works Yard on Randolph Avenue completes the active town installations in the section. The yard is adequate in size, centrally located and does not present too great a problem to the surrounding uses.
Planning Organization and Operation

In the day-to-day administration of its zoning ordinance and subdivision regulations, the Milton Planning Board with the assistance of the Town Engineer is doing an excellent and systematic job. At the longer term task of Master Plan preparation and effectuation, however, the town has not progressed so favorably. While a considerable amount of planning work has been done, it has been performed at different times by various consultants on contract. The work is fragmentary, somewhat unrelated, has not been kept up to date to meet changing conditions, and has not been sold to the public. The School Committee and the Boards of Water and Sewer Commissioners proceed independently with their own plans. A separate committee called the Financial Planning Committee has been constituted to try to organize financial planning.

Starting as it is on the last big phase of development, Milton would be wise to concentrate its annual expenditures for planning on the hiring of a full or part time resident planner to develop, coordinate, and push the effectuation of all planning in the community; and to augment those expenditures as necessary.

Summary of Problems

The primary problems which must be solved in planning for the watershed are those of controlling and using the waters of the brook; and of locating the express
highways through the area in such a way as to have the most beneficial and least deleterious effect upon community organization and life.

Following the solution of these factors, the problem is one of organizing the community of West Milton, developing neighborhoods where there is no neighborhood concept or organization. At the root of that problem is the necessity for building a school system that will provide the best possible coverage while still fitting into the neighborhood concept. Related problems are those of providing adequate recreation facilities on a neighborhood basis and providing neighborhood shopping centers. Even after the removal of through traffic by the expressways, the remaining traffic pattern will have to be simplified and reorganized so as to have a less disruptive effect upon day to day living.
DEVELOPMENT PLAN

Floods and Flood Control

The character of the flood problems, and the varying effects on the value of different methods of providing flood control, are the principal reasons for studying the Pine Tree Brook watershed as a separate unit. The nature of methods taken to control floods will have a considerable effect upon land use in the valley and as a prior consideration to other uses, must receive first attention in planning.

Floods on Pine Tree Brook have been a menace to the town since earliest recorded history. The official history of Milton² (published in 1887) discusses in detail the largest known flood of the brook, which had occurred the previous year. Early in February of 1886, a sixty hour storm brought 6.13 inches of rain which was augmented two inches by the melting of a foot of accumulated snow. To quote the chronical, "This unprecedented amount of rain and melted snow, pouring down from the hills filled the meadows and overflowed every channel of egress. The little Pine Tree Brook became a raging torrent. The bridges were insufficient to carry the stream which swept over, and rendered impassable all the roads in its line, in many cases undermining and destroying both bridges and roads.
"There has been nothing like it in the history of the living. One hundred and eighty-seven years ago occurred a flood perhaps equal to this...."

In 1939, the Town Planning Board requested and received town funds for an engineering study of the flood problem. Howard M. Turner, a Boston consulting engineer, was retained to prepare plans to combat the flood problem. Mr. Turner's exhaustive studies of rainfall and run off furnished hydrological data which alone make this part of the report possible. In order to plan any measures of flood control the kind of storms that may be expected must be predicted. Plate 6 shows the rainfall frequency curves as computed by Mr. Turner. Reduced to simple numerical values for a 24 hour and 60 hour storm the quantities are as follows:

<table>
<thead>
<tr>
<th>Period in which Flood Flow is likely to be Exceeded</th>
<th>60 hour storm rainfall (inches)</th>
<th>24 hour storm rainfall (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 years</td>
<td>6.7</td>
<td>5.2</td>
</tr>
<tr>
<td>50 years</td>
<td>9.0</td>
<td>6.7</td>
</tr>
<tr>
<td>100 years</td>
<td>10.9</td>
<td>8.1</td>
</tr>
<tr>
<td>probable maximum</td>
<td>16.6</td>
<td>12.0</td>
</tr>
</tbody>
</table>

The storm of 1866, it may be seen, was something approaching the 50 year, 60 hour storm, and was augmented by melting snow to the level of a hundred year storm.

While it is very doubtful that the "probable maximum" will be reached in the next thousand years, the level should
PLATE 6

RAINFALL - FREQUENCY CURVES
FOR
MILTON, MASS.

Edward M. Turner
Consulting Engineer
Boston, Mass.
May, 1940

STORM FREQUENCY IN YEARS
be kept in mind in flood planning. A storm as great or
greater than that of 1886, however, is a distinct possibility
any year.

The amount of water that will run off from a rain
storm of a given size in a particular watershed is deter-
mined by the intensity and duration of the rainfall, the
amount of melting snow, the condition of the ground at the
time of the storm, the character of the ground surface and
vegetation, and the amount of storage in the stream bed,
ponds, and swamps. In the watershed in question there has
been a trend toward increased surface run-off, and a
marked trend toward increased peaking of the run-off be-
cause of the gradual building up of the watershed. Every
roof and paved area has reduced the chance of water seep-
ing in to run off more slowly through underground channels,
or of moisture being absorbed by vegetation. Every gutter
and storm sewer has brought water just that more quickly
to the brook further concentrating flood flow.

In addition, new houses have pushed in on the swamps
previously used for storage in flood time. Storage which
is still available to reduce flood peaks is threatened in
the more or less distant future. Pope's Pond, swamp land
along the brook between Canton Avenue and Blue Hills Park-
way, and Turner's Pond will probably be eliminated in the
near future barring staying action by the town. Even large
swamps east and west of Harland Street face eventual
elimination.
Minor channel improvements prior to 1940 only partly compensated for this trend toward increased flood size; they failed to balance it by a considerable margin.

While this increase in potential flood height has been occurring, the damage potential of floods has also increased. Although early floods caused damage to gardens, roads, and bridges; the destruction was not perhaps insufferable. The development of the watershed has led to the construction of more and more houses in areas where basements, and in some instances, first floors are subject to flooding. In addition, the town's investment in bridges and roads crossing the stream has increased in value. A situation has thus gradually been created wherein major floods have become too expensive to be tolerated.

Mr. Turner used a run off factor of 60 to cover conditions as they would be at the end of the design period. This run off factor was borrowed for use in the calculations involved in this report. It does not make any allowance for melting snow, or for the ground being heavily soaked by previous rains. Since the greatest possibility of serious floods is in the late summer, early fall hurricane season, it is not probable that these conditions will exist.

The analysis of the flood problem in the basin prepared by Mr. Turner demonstrated that the principal blame for the brook's inability to handle flood run-off could be placed on a very small channel gradient between Central and Canton Avenues; and on stream constrictions caused by
inadequate bridges and old dams. The existing stream capacity was found to be only some 150 cubic feet per second at Central Avenue, an amount utterly inadequate to meet peak flood flows of two to three times that amount.

The basic idea of the Turner Plan is stated succinctly in the following quotation from this report:

"It is clearly not economical to provide for an extreme flood on Pine Tree Brook and the plan presented is designed for a flood that may be equalled or exceeded once in twenty years. Under present conditions, that is, with the watershed as it is now, 300 cu. ft. per sec. peak flow at Central Avenue, in my opinion represents a flow of this "frequency". With the brook as it may be in the future with much of the swamp area eliminated and the lower brook built up and the storm drains becoming a larger factor, this "twenty year flood", in my opinion, may be taken as 500 cu. ft. per sec.

"As ultimate development of Pine Tree Brook should, therefore, consist of a channel which will carry 500 cu. ft. per sec. safely and the plan proposed is designed to carry this amount of water below Blue Hill Parkway (about 440 cu. ft. per sec. above) without raising the water at any point any higher than it was this spring which did no damage, and with an elevation of 1 ft. lower than it was this spring just
above Thatcher street.

"It must be clearly understood that it is possible to get a flood larger than this and that such a flood may come at any time. Just because, based on past experience, a larger flood is not to be expected at greater intervals than 20 years, does not mean that such a flood may come at any time, even next year, but it is not economical to provide for such a contingency". 4

Hydrographs on the two types of 20 year storms as prepared by Mr. Turner are presented in Plate 7. According to his report, the greater flood danger at the present time would come from a 60 hour storm with the rainfall fairly evenly distributed over the period, while the greater danger for the future lies in a 24 hour storm with extremely heavy rainfall concentrated in a short period. A 60 hour storm, therefore, as used in the balance of this paper, refers to a storm with precipitation well spread through the 60 hour period.

The plan prepared by Turner to meet the 20 year, 24 hr. storm, expected - future condition of 500 cfs peak flow at Central Avenue, consisted of increasing the channel gradient cross section, and replacing bridges that have inadequate clearance. The expenditures involved in the plan were estimated at 1940 prices as follows:
PLATE 7

FLOOD HYDROGRAPHS

Pipe Tree Brook
at
Central Ave.
Milton, Mass.

Howard M. Turner
Consulting Engineer
Boston, Mass.
May, 1940
<table>
<thead>
<tr>
<th>Project Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel Improvements, Canton Avenue to Blue Hill Parkway</td>
<td>$10,215</td>
</tr>
<tr>
<td>New Blue Hill Parkway Bridge</td>
<td>31,675</td>
</tr>
<tr>
<td>Channel Improvements, Blue Hill Pkwy to Thatcher St.</td>
<td>8,528</td>
</tr>
<tr>
<td>New Thatcher St. Bridge</td>
<td>11,025</td>
</tr>
<tr>
<td>Channel Imp. Thatcher St. to Brook Road</td>
<td>13,925</td>
</tr>
<tr>
<td>New Brook Road Bridge</td>
<td>18,792</td>
</tr>
<tr>
<td>Lowering Metropolitan Sewer, additional</td>
<td>2,833</td>
</tr>
<tr>
<td>Channel Improvements - Brook Road to Central Ave.</td>
<td>16,404</td>
</tr>
<tr>
<td>Improvements to Central Ave. Bridge</td>
<td>4,115</td>
</tr>
<tr>
<td>Channel Improvements, Central Ave. to Turner's Pond</td>
<td>3,000</td>
</tr>
<tr>
<td>&quot;                                   , Turner's Pond</td>
<td>6,136</td>
</tr>
<tr>
<td>&quot;                                   , Turner's Pond to School Street</td>
<td>13,220</td>
</tr>
<tr>
<td>Elimination of Ruggles Lane Bridge</td>
<td>2,896</td>
</tr>
<tr>
<td>Improvement of School Street Bridge</td>
<td>1,320</td>
</tr>
<tr>
<td>Channel Improvement, School St. to end of new channel</td>
<td>3,432</td>
</tr>
<tr>
<td>&quot;                                   , End of new channel to Neponset River</td>
<td>10,355</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$157,858</strong></td>
</tr>
</tbody>
</table>

Recognizing, as he did, that the complete improvements were not necessary to meet the 300 cfs flow expected from a 20 year flood under conditions existing in 1940, Turner derived a partial plan designed to meet that situation. This partial program was taken from the complete plan so that the work involved in it, would fit into the final plan with a minimum of waste. It consisted of the items covering the replacement of the Thatcher Street and Brook Road Bridges, the lowering of the M.D.C. sewer, the improvement of Central Avenue Bridge; and the partial completion of items covering channel improvements between Blue Hill Parkway and the School Street Bridge, and was estimated to cost $61,000.

Action of the Turner Plan was delayed by the war period and the subsequent period of presumed temporary high costs. The lack of serious floods since 1936 has
resulted in a temporary lull in public demand for such action.

While the complete Turner plan would alleviate the flood problem, it would also produce some results that might not be so favorable. The draining of Pope's Pond, necessitated by the plan, would open that area for development and remove a source of openness and beauty from the town. While draining the pond would provide taxable land, resources which are worth far more than the net revenue that would accrue from opening this land for development would be destroyed. If Turner's Pond were drained, as is provided as an alternative to one portion of the plan, equally bad effects would accrue.

Another result of the Turner plan would be that drainage would be much more rapid, leaving the channel dry or nearly dry, and open to the growth of vegetation a considerable portion of the time. Along with decreasing the attractiveness of the brook, this condition would increase the cost of maintaining the channel against clogging vegetation. It would also reduce the possibility of maintaining Turner's Pond in fresh condition. Under existing channel conditions this pond is likely to become foul in dry weather. (In the exceptionally dry summer of 1949 the pond dried out and truckloads of rotting fish had to be hauled away.)
Although there is no question as to the technical excellence of the Turner plan, it is perhaps possible to question the approach. There are two methods of controlling floods so as to alleviate damage; the first consists of speeding the run off by providing a high velocity channel; the second consists of impounding part of the water so as to reduce the crest. Usually in control schemes involving larger rivers, both methods are used. Since there is an excellent site in the Pine Tree Brook watershed for an impounding reservoir, the author questioned the reliance of the Turner plan solely upon channel improvements. It is understood that Mr. Turner had considered a reservoir but had rejected the idea on the assumption that housing was a superior use of land so close to the heart of Boston. The author considered that assumption open to serious question. The swampy and low character of most of the land involved, makes it unlikely that it would be developed into housing that would be an asset to the town. On the other hand, the assets to the town of the open areas of Turner's Pond, Pope's Pond and the Harland Street swamp areas are real and considerable. From a regional standpoint, the building of proposed new expressways will bring large areas of much superior quality as housing lots into as close a time-distance relationship to the heart of Boston as the reservoir site presently possesses.
The comparison of possible alternative reservoir or reservoir-channelization plans is made possible by the Turner plan which prescribes a given degree of flood protection and gives its cost. A rule of thumb in a search for an alternative must be that it furnish at least equivalent flood protection at less cost, or provide extra benefits commensurate with any greater cost.

The problems then, consist of finding: (1) if a reservoir is feasible from an engineering standpoint, (2) if a reservoir or a reservoir-and-channel-improvement program will provide equal or greater flood protection, (3) if such an alternative program will provide other advantages, and (4) the cost of such an alternative program.

Consideration of an impounding basin was originally stimulated in the author's mind by the existence of an admirable dam site on upper Pine Tree Brook about one half mile south of Canton Avenue. (see plate 11). The wide upper valley is narrowly constricted at this point by high hills that close in the wide valley to a narrow defile, little more than a hundred yards wide. Approximately 2625 acres, or 60% of the total drainage area above Central Avenue, is above the dam site; providing considerable potential control.

The height of the reservoir is limited by the elevation of Randolph Avenue, an important state route that crosses
the valley to the East and dips at its lowest point to 65.4' elevation.* With that highway as a control, at least for the present, 64' is about as high as water can be allowed to rise. (Approximately a quarter of a mile of Randolph Avenue, would have to be reconstructed in order to raise the elevation of the reservoir.) Virtually the only other physical improvements that would be disturbed by a dam at this elevation are Harland Street and Unquity Road. Harland Street is expendable since it serves only a small estates area whose few families have substitute routes that are only slightly longer in Randolph Avenue and Unquity Road. The relocation of some 4000' of Unquity Road that would be necessary could probably be met by the M.D.C. since, as will be shown later, their recreation facilities would be considerably enhanced by the project.

Construction of a dam with an overflow at 64' would create a basin with a storage capacity of 2,600 acre feet, virtually one acre foot of storage for each acre of drainage area. In other words, twelve inches of run off from the drainage area would just fill such a basin. As twelve inches of run off is more than can be expected from the theoretical "maximum possible" storm of 16.6 inches with 60% run off, it is apparent that a dam with overflow at this elevation would have more capacity than needed. The excess

*All elevations Milton Base, coinciding with Boston Base.
is even greater when it is considered that it is not necessary to completely impound flood run off to provide flood protection, but only to reduce stream flow to quantities that can be handled safely. In the proposed dam a limited capacity outlet works would be established that would release some water with normal stream flow, and increase the quantity in pre-determined amounts as head increased in the reservoir.

To determine the effectiveness of the dam, in controlling flood peak at Central Avenue, it is necessary to study flood conditions on the balance of the reservoir with the dam impounding all flow from the upper 2,600 acres. It was estimated that due to the growing number of storm drains, the higher ratio of developed area, and the scarcity of natural storage; the lower, uncontrolled 2,200 acres would produce floods more than half as great as the flood from the total 4,800 acres in a 60 hour storm. However, in a 24 hour storm the storm drains in the lower area would perhaps reduce peak flow to less than half by moving off the intense downfall from the lower area before the peak rainfall from the upper areas reached Central Avenue. The reduction in flood volumes with use of the reservoir would be considerable as shown in Table 2.
Table 2
Flood Peaks at Central Avenue
With and Without Complete Retention by Proposed Reservoir

<table>
<thead>
<tr>
<th>Period in which flood is likely to be exceeded</th>
<th>60 Hour Storm (Present Conditions)</th>
<th>24 Hour Storm (Future Conditions)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Peak Flow Without Reservoir (Turner)</td>
<td>Peak Flow With Reservoir (complete storage) except for base flow</td>
</tr>
<tr>
<td></td>
<td>cfs</td>
<td>cfs</td>
</tr>
<tr>
<td>20 years</td>
<td>300</td>
<td>180</td>
</tr>
<tr>
<td>50 years</td>
<td>380</td>
<td>225</td>
</tr>
<tr>
<td>100 years</td>
<td>460</td>
<td>270</td>
</tr>
<tr>
<td>Probable Maximum</td>
<td>700</td>
<td>400</td>
</tr>
</tbody>
</table>

It is apparent from the above table that the reservoir, by itself would not be sufficient to reduce floods to manageable proportions since the present channel will pass only some 150 cfs without flooding. Some channel improvements will also be needed. However, it may be noted that the flow from a twenty year storm is less than the 300 cfs level proposed by Turner as a temporary measure. If the increment from the dam, at the time of the flood peak were limited to 50 cfs, the Turner 300 cfs channel would suffice to handle 20 year floods under future watershed conditions.

The peak flow could be still further reduced by diverting the flood flow from the upper half of the Trout Brook drainage area. At a point just above Atherton Street, see Plate 7A, Trout Brook is very close to a natural diversion into an unnamed stream which flows south westward from that
PROPOSED FLOOD CONTROL MEASURES

MAP OF MILTON MASSACHUSETTS
point to the Neponset. Constricting the entrance to the culvert under the street at that place so that only a small "normal" flow of something less than 5 cfs could pass would be a simple measure. The flood flow could be diverted through a new channel, graded along Atherton Street to the other brook. Securing legal rights to divert this excess flow would perhaps be a more difficult problem, although presumably not an insolvable one. The diversion would be through undeveloped land that is part of the large grounds of the Jeanne D'Arc academy and would do no damage to present developed area.

The reservoir and diversion together would reduce flood flow to a point wherein almost any flood could be handled with a 300 cfs channel. The flood protection afforded would be far superior to that of the complete Turner Plan as shown in Table 3.
### Table 3
PROSPECTIVE FLOW DATA AT CENTRAL AVENUE
Pine Tree Brook

<table>
<thead>
<tr>
<th>Period in which given flood is likely to be expected</th>
<th>24 Hour Storm (Future Conditions) Stream Flow at Central Avenue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Without Reservoir (Turner)</td>
</tr>
<tr>
<td></td>
<td>c.f.s.</td>
</tr>
<tr>
<td>20 years</td>
<td>500</td>
</tr>
<tr>
<td>50 years</td>
<td>645</td>
</tr>
<tr>
<td>100 years</td>
<td>810</td>
</tr>
<tr>
<td>Probable Maximum</td>
<td>1200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>60 Hour Storm (Present Conditions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 years</td>
</tr>
<tr>
<td>50 years</td>
</tr>
<tr>
<td>100 years</td>
</tr>
<tr>
<td>Probable Maximum</td>
</tr>
</tbody>
</table>

The following table compares the adequacy, or relative inadequacy of the two plans to handle severe floods.

### Table 4
RELATIVE ADEQUACY OF COMPARATIVE PLANS UNDER SEVERE FLOOD CONDITIONS

<table>
<thead>
<tr>
<th>Period in which given flood is likely to be expected</th>
<th>Turner Plan</th>
<th>Alternative Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>500 cfs channel</td>
<td>storage reservoir diversion of Trout Brook 300 cfs channel (as per Turner)</td>
</tr>
</tbody>
</table>

#### 24 Hour Storm

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20 years</td>
<td>adequate</td>
<td>adequate</td>
</tr>
<tr>
<td>50 years</td>
<td>inadequate by 145 cfs</td>
<td>inadequate by 29 cfs</td>
</tr>
<tr>
<td>100 years</td>
<td>310 cfs</td>
<td>96 cfs</td>
</tr>
<tr>
<td>Probable Maximum</td>
<td>700 cfs</td>
<td>244 cfs</td>
</tr>
</tbody>
</table>
It will be seen that the alternative plan offers considerable superior flood protection. Other advantages and disadvantages of the two plans will be discussed later.

In order that the economics of the two systems could be compared, it was necessary to prepare preliminary designs for the reservoir and dam so that the costs and indirect benefits thereof could be compared. It has been noted previously that with overflow of the dam at 64' there would be 2600 ft. of storage capacity, or more than enough to halt the worst flood. Computations involving inflow and allowable discharge from the reservoir indicate that the flood storage volume of some 1400 acre feet is sufficient for flood control purposes. The 1200 acre feet of excess capacity could be eliminated by decreasing the height of the dam. However, the savings involved by knocking 4 feet off the top of the dam to accomplish this would only be some $410,000.

If the dam were to be retained at maximum height, however, and the top 1400 acre feet of the potential storage utilized for flood storage, the lower 1200 acre feet could be maintained in permanent pondage.* The advantage of the permanent pondage would more than compensate for the slightly higher cost. They are:

1. The creation of a 270 acre lake available for swimming, boating, fishing, and other water sports. While most of the pond would be only some 5' deep, deeper

* All cost estimates were prepared prior to the Korea incident.
places for swimming and diving could be graded before the pond was filled. In addition, the banks of the reservoir would make beautiful park land for hiking and picnicing. Shore line not needed for park purposes would have a greatly enhanced residential value.

2. The establishment of ability to draw down the permanent pondage in the winter in equivalent amount to any heavy accumulation of snow, thus furnishing protection against the possibility of a melting snow reenforcing run off from a heavy rain.

3. The elimination of swamps that are a breeding place for mosquitoes.

4. The guaranteeing of a continuous supply of water for the lower brook, even in the driest summer; insuring flow in the stream bed and fresh water in Pope's and Turner's Ponds. While this depletion would interfere with recreational uses in the driest months, it is probable that this would not markedly interfere with recreation in more than three or four years out of a hundred. Even in the driest years the beaches could be used for swimming if developed according to plans suggested in following sections of this report.
Final specifications for the alternate plan would then be:

1. The creation of a reservoir above Canton Avenue, with permanent pondage up to an elevation of 59 feet, and flood storage between 59' and 64'; the dam to contain a small outlet works that will deliver a flow of less than 50 cfs to Central Avenue. The dam also is to have an overflow works at the 64' elevation sufficient in size to prevent water from rising over Randolph Avenue at 65'.

2. The dam to be designed so as to have a gate controlled drain sufficient in size to drain the reservoir should that ever prove necessary.

3. The Pine Tree Brook channel to be improved by the recommendations contained in the partial Turner Plan to a capacity of 300 c.f.s. at Central Avenue.

4. The construction of a diversion system at Atherton Street for Upper Trout Brook.

Although it has been shown that a reservoir plus the diversion will provide much superior flood protection, the substitution cannot be warranted unless it is relatively as economical as the Turner Plan. Fortunately, having cost estimates for the complete and the partial Turner plans makes cost comparisons possible. The figures for those plans, brought to pre Korea 1950 prices by application of the Engineering News Record Index is $264,000 for the complete plan, and $109,000 for the partial plan. (Since
costs of different types of construction have varied considerably, these figures are more indicative than absolute.

Pages 1 ff of the appendix discuss the estimation of costs of the reservoir plan. Suffice to say here that cost estimates for the reservoir plan were only some 10 to 15% higher than for the complete Turner Plan.

In justifying the 10 to 15% higher price the alternative plan possesses the following advantages.

1. Considerably superior flood protection.
2. The possibility of providing complete flood protection at relatively minor additional cost.
(The complete Turner Plan could only be substantially improved through difficult and expensive work on the lower channel involving rebuilding of the M.T.A. bridge, the Eliot Street Bridge, the Central Avenue bridge, and extensive channel improvements.
3. The preservation of brook flow in summer months.
4. The creation of extensive and excellent recreation facilities.
5. The preservation of Pope's Pond.
6. The elimination of swamps.

While the creation of the reservoir will eliminate some 350 acres from the tax roll this land only has an assessed value of between $35 to $40,000. As it is largely swamp land, or land adjacent to swamp, there is little probability of any great revenue from the area in the for-
seeable future. On the otherhand, creation of the reservoir will undoubtedly stimulate building in the one acre zoned residential land around it. It is building in the one acre zone that has been found to yield the greatest net revenue to the town.

As it is not possible to arrive at a concrete solution to the cost problem without considerable expense, the author has proceeded on the premise that the preliminary estimate, which shows the costs not to be disproportionate, especially in view of the added advantage will be born out by complete engineering studies. The following plans for the valley are, therefore, predicated on the creation of a reservoir, substantially as described above, and the completion of the first portion of the Turner plan.

Other considerations involved in this decision will be discussed in sections of this report dealing with land use, recreation facilities, streets and highways. Harland Street, for instance, will be severed; recreation areas for both M.D.C. and the town will be planned at the lake, and land use in areas such as Pope's Pond will be planned around the possibility of pond retention.

Plate 11 shows the reservoir and surrounding uses as proposed.
REGIONAL EXPRESSWAYS OF PARKWAYS

1. Expressways

In addition to planning to meet the flood problem, planning of major arterial highways must be accepted as a prior requirement to general planning. Milton stretches across virtually the entire southern approach to Boston. Because of this fact it will inevitably be crossed by at least one of the expressways necessary to carry motor traffic safely and expeditiously to and from central Boston. The location of any such routes is a major determinant in planning and control of expressway location is entirely within the hands of the State. Notwithstanding this fact, the town can participate in a limited way in determining location by using what influence it can muster to affect State policy and by acting in any possible way to keep desirable rights-of-way free of development. If more than one alternative route is open for expressway, the town may be able to influence the location by encouraging development along one right of way and discouraging it along the other.

The Commonwealth and the City of Boston have done a considerable amount of study relative to an expressway program for the Boston Metropolitan Area culminating in a report called "A Master Plan for Metropolitan Boston". This report was prepared in 1946 by Charles Maguire Associates and sometimes is referred to as the "Governor's Plan".
It is apparent that one route shown on the Governor's Plan, the South-East Expressway, will have to bypass somewhere through East Milton. At any rate this route and its relation to East Milton and the entire town are part of another study. It is the only route proposed in the plan to pass through Milton, although an extension of the American Legion Highway to Truman Highway at the north edge of Milton was also proposed.

In addition to the routes shown on the "Governor's Plan", the State Public Works department has started work on an expressway connecting Boston and the Fall River-New Bedford area. The northern terminal of this route has been tentatively planned as cutting across Milton. The road is to be located between Routes 138 and 28 to relieve both of above design capacity traffic. In this function it will remove traffic in Milton from Blue Hills Avenue (Route 138) and from the Randolph Avenue-Mattapan route (Route 28). As pointed out in the survey there is a great need for this type of facility.

The location of the Milton portion of the route, as has been tentively discussed by the State Highway Department officials, is not advantageous to the town. Starting from the end of the proposed American Legion Highway extension, it would cross Canton Avenue near the intersection of Blue Hills Parkway, and continue south, passing just west of Ponkapog Pond. The section between Truman Highway and
Canton Avenue would pass through a developing residential neighborhood, splitting it in two. It would force the removal of a large number of homes and come close to many others. The heavy traffic of the all purpose route would undoubtedly cause a depreciation of property values and living conditions in this area. Furthermore, the location of necessary access points in the town would generate undesirable and unnecessary traffic on local streets.

Besides these local disadvantages, the route is daily becoming a greater financial problem to the State. The area between Brush Hill Road and Canton Avenue that must be traversed is rapidly being built up with streets and homes. Although the town has forestalled development of certain small areas by retaining title to tax foreclosed property on the general route, privately held land has been developed, and is currently being developed, at a rate that will soon make the right of way costs of such route prohibitive.

While the expense and the disruption of the residential neighborhood might be warranted if this were the only possible satisfactory route that could be traversed by the highway, it would not be if a satisfactory alternate route were feasible. Such a route is possible. The road can be located to the west of Milton by either of two possible routes, both of which are superior in many respects
to the route through Milton. While they are approximately a half mile (about 7%) longer than the cross Milton route, they have the advantages of better grades, fewer bridges, and less pavement construction. The alternate routes follows Truman Highway, improved to expressway standards, to a point south of Paul's bridge. (This much of the route is shared with the South-West expressway which the State has tentatively agreed to reroute to this location from the more northerly route proposed in the Maguire Plan).

Splitting from the Southwest connection at the inoperative Reedville Race Track, or alternately at Route 128, the route would swing south and east to meet the section of the road already under construction.

Traffic from the Fall River Area and from U.S. Route 1 would be thus combined on Truman Highway. Large volumes of traffic concentrated at this point would undoubtedly increase East-West traffic across Milton by the Eliot Street or Brook Road route, both of which are already so overloaded as to require a new East-West route. To meet this need the Truman Highway or what might more properly be called the Neponset Expressway, could be continued East over the MTA right-of-way, at virtually no right-of-way cost, to connect with Dorchester; Squantum, with its important Naval Air Station; and Quincy. Bus or trolley bus could be used to replace the streetcars which now operate on a maximum headway of 10 minutes. This route
would so relieve Route 135 (Canton Avenue) of some of its traffic.

It is proposed to connect the Boston parkway system to this extension as shown on the area highway plan, Plate 8, to further reduce traffic on Brook Road between Mattapan and Quincy.

Development of Truman Highway to expressway standards would require the removal of border friction in Milton now caused by 26 dwelling structures fronting directly on the highway. It is proposed to accomplish this by moving the highway closer to the river and creating a service drive to give access to the houses. Plate 11 shows proposed development of this route.

The problem of handling access to the proposed expressways and parkways is as important to the town as the location of the routes themselves. An access or egress from an expressway will generate a considerable amount of traffic, traffic which must be kept from injuring residential enclaves. While it might be advantageous from the standpoint of the Milton motorist to have a direct access to the highway to take him very quickly to the heart of Boston, he should realize that quick access may endanger the safety of people in his neighborhood.

Access to the expressways can be readily provided at South of Milton at the crossing of Route 128. To the East, access can also be provided near Paul's Bridge from the
Parkways and Route 135. Except for the division of the two expressways North of Beacon Street Circle, there should probably be no access before Mattapan. Access at Mattapan is necessary to serve the commercial area and because of the large amount of traffic concentrated at this point. Access to the Neponset Expressway from a place East of Mattapan, at Central Avenue or the Lower Mills would be beneficial from the standpoint of the motorist, and would be generally desirable if it could be done without increasing traffic in these areas. However, the route is crowded into a narrow ledge along the river and any kind of access would be difficult to secure. The only feasible method seemingly is to carry Randolph Avenue under Adam's street and over the river on a separate bridge. While this plan is technically possible the advantages would not warrant the considerable cost. It would also undoubtedly lead to increased traffic on Randolph Avenue, a result that is not too desirable.

As this plan would supersede previous plans for a Neponset River Parkway some justification of the move is required. In reality it would only take the place of the parkway between Mattapan and Milton Lower Mills. West of Mattapan, the proposed parkway would have utilized Truman Highway as a mixed traffic road, and East of Mattapan the routes of the parkway are still open for parkway construction. It is the author's contention that the proposed parkway route on the North bank between Mattapan and Lower
Mills is impractical because of high land damages and because it proposed to route traffic through the already heavily overloaded Pierce Square and Mattapan Square intersections. The scenic values of the short stretch on the North bank are not impressive due to the MTA tracks on the south side and the constriction of view by the high south bank.

Placing the route on the south bank will be much more advantageous from traffic and land damage standpoint, and construction costs will probably be somewhat equivalent to the North bank route. Location on the railroad right-of-way will require use of the road by busses and since it will connect Route 1 and the Boston-Fall River Expressway with the South-East Expressway it should be open to general traffic.

II. Regional Parkways

There exists only a short gap between the parkway system of the Blue Hills Reservation and the Boston Parkway system. It is proposed to connect these routes to give access to the new Blue Hills Recreation area at the west end of the reservoir, and to provide an all parkway route to Quincy and the South Shore. Most of the right-of-way for this parkway is already owned by the M.D.C. and the balance consists of undeveloped land. This route would aid the Neponset Expressway in reducing the East-West traffic across Milton.
The tie in of the proposed expressway system with existing and proposed parkways and expressways in the Boston area is shown on Plate 8.

Planning to handle the remaining traffic on Town streets must be coordinated with neighborhood planning and will therefore follow later in the report.

Community Pattern

While West Milton can never hope to be as well coordinated a community as East Milton, a considerable core of community activities can be developed around a community center. The basis for this center should be a separate junior high school connected with a community center building and a community athletic field. While not ideally located from a standpoint of population distribution, the thirty acres recently purchased by the town off Canton Avenue is within a mile of virtually all of the people of West Milton, and is of ample size for the purpose.

West Milton, with its expected population of around twenty thousand, can be divided into four neighborhoods, each centered around a grade school and playground. As far as possible, each neighborhood center should also contain a small shopping area. The neighborhoods should be so organized that virtually all people living in closely developed areas are within easy walking distance (half mile radius) of schools and shopping facilities. Traffic should be so organized as to circumvent neighborhoods wherever possible. Where it is not possible to remove traffic from
a neighborhood it is desirable that the school be placed close to the traffic street so that crossing can be controlled at one point.

Efforts should be made in developing the neighborhoods to make their centers as attractive as possible. Every effort should be made to take advantage of naturally attractive sites, and the beauty and pleasantness of the areas be given every possible consideration.

**Land Use**

Except for the uses later prescribed for neighborhood shopping and for public uses, or land already used for other purposes, the land will all be open to residential development. This development, by public demand, will be kept to single family residence. The question remains as to what density development will be allowed, or more simply, how much land shall be required per family. The present zoning ordinance has three classifications of lot size, 7,000 square feet, 20,000 square feet, and 40,000 square feet. Virtually all of the 7,000 square foot area has been used up and it is probably undesirable, from the standpoint of the town's financial status, to create any more 7,000 square foot areas. However the jump from that density of five or six families per acre to one of two families per acre, is believed to be too abrupt. A more gradual gradation of permissible lot sizes will make the change from zone to zone almost imperceptible. Some reduction in zoning restrictions should be made around the
school sites in order to insure sufficient population within walking distance to support the schools. It is, therefore, desirable that a zoning classification between the 7,000 and half acre lot size be allowed.

Another area which should have a change in standards is the outlying area; that is, the area so far out from schools, shopping, and other facilities as to require transportation for adequate service. This area, occupied primarily by large estates and farms should be given more restrictive zoning than the current one acre provision. A higher minimum frontage requirement than the current one acre zone requirement (150 feet) will help to keep border friction to a minimum on the highways in the area.

Table 5 shows the relationship of present and proposed zoning for residential densities.

Table 5
President and Recommended Minimum Lot Areas for Residential Zones

<table>
<thead>
<tr>
<th>Present Minimum</th>
<th>Proposed Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frontage  Area</td>
<td>Frontage  Area</td>
</tr>
<tr>
<td>Res. C.  70  7000</td>
<td>Res.  1  70  7,000</td>
</tr>
<tr>
<td>B    100  20,000</td>
<td>2    100  13,000</td>
</tr>
<tr>
<td>A    150  40,000</td>
<td>3    125  20,000</td>
</tr>
<tr>
<td></td>
<td>4    150  40,000</td>
</tr>
<tr>
<td></td>
<td>5    200  80,000</td>
</tr>
</tbody>
</table>
While exact determination of area boundaries for these proposed density zones can only come through more thorough investigation and public discussion, the general arrangement shown on Plate 9 is suggested. Plate 11 shows approximately how this zoning would effect development of the land with streets and houses.

It is recommended that the Brush Hill area be placed in two acre zoning to protect it against encroachment from the Hyde Park area. Public purchase of land in this area, or purchase by tax free quasi-public uses would be preferable to breaking down the zoning. It would be desirable if a large border area could be transferred to Boston as a park, providing iron clad legal restrictions were obtained to prevent it from ever being diverted to other uses.

The previously mentioned isolated area in the South of Milton should be purchased by the town to prevent a development that would be continuous strain upon the municipality. The area could be turned over to the M.D.C. with or without financial remuneration for incorporation with the bordering Blue Hill Reservation. The riding stables in the area could continue under long term lease.

Purchase of a smaller area for transfer to the M.D.C. is recommended at the head of the reservoir, as shown on Plate 11.

Of the non-conforming industrial uses, the building materials plant between Ferncroft Road and Victoria Street is the only one that is potentially unharmonious and the
situation in regard to this plan is not serious. In view of this, present restrictions on non-conforming uses are probably adequate for this section of town.

Schools

Since the elementary school is the major element in the nucleus of the neighborhood, locations and general service areas of the schools must be determined. With an eventual well distributed population of around 30,000 and the present ratio of public school attendance, Milton will require six elementary schools. Four of these will be needed in West Milton. Tucker School is the only school in the section that is an adequate building adequately located. The authorized school off Canton Avenue, while located in the center of a large, inadequately served area, has been unfortunately sited in relation to future needs. It is in the center of an area that would better be served by two schools, one in the vicinity of Pope's Pond, and the other in the vicinity of the town center. A fourth school located just north of Turner's Pond would give complete school coverage to the entire closely developed area of West Milton.

The locations have been chosen with a view towards serving the largest residential area possible while still maintaining some overlapping of service areas.

Since the construction of the Canton Avenue school has been authorized, it is recommended that this school be completed but that any changes in plans be carried out that
will facilitate the eventual change of the school to a Junior High School. Until the time when it becomes necessary to utilize the school as a Junior High School it should be operated as a grade school. When future heavy loads in the Junior and Senior High Schools make it necessary to use the Canton Avenue building as a Junior High to relieve the High School, the proposed schools at Pope's Pond and the town center should be built. By that time much of the vacant land around Pope's Pond will undoubtedly be built up, fully establishing the need for the school.

Plans for proposed schools are as follows:

1. **Tucker School** - Playground should be enlarged at once by purchase of the house and grounds to the west. A plan should be developed for the eventual closing of Oak Street, and the extending of the playground across that street by purchase and removal of houses therefrom.

2. **Turner's Pond School** - Land should be acquired immediately in conjunction with Turner's Pond Park. School to be erected as soon as arrangements can be made.

3. **Pope's Pond School** - Land should be acquired immediately in connection with Pope's Pond Park. School to be erected when Canton Avenue school is converted to Junior High School.

4. **New Vose School** - School to be located on town owned land across from the Town Hall. The sole
PLATE I

EXISTING AND PROPOSED SCHOOLS
AS RELATED TO POPULATION DISTRIBUTION

○ FIVE FAMILIES, 1950
X FIVE ADDITIONAL FAMILIES, FUTURE

Large circles indicate one half mile service areas.
remaining privately owned property in the block, the home and lot adjacent to the library should be acquired as soon as convenient so that school will be adjacent to the library. A general site plan should be prepared at once and the filling of valley gradually carried out to establish grade of plans. The building should be erected concurrently with Pope's Pond School.

Neighborhood Recreation Facilities

According to accepted standards, 6 neighborhoods of the size proposed should have minimum size playground of six acres. These playgrounds are to provide for sports or games for children up through junior High School age. In multi-family areas, there should be tot lots designed for the use of very small children and so located as to be within a quarter of a mile of each house.

In addition to these standards, the author has suggested in additional stipulation for Wilton, that is, that every neighborhood playground contain swimming facilities suitable for children's play and swimming instructions; and for cooling dips and limited swimming for adults. These pools are more than just a recreation facility, they are a practical necessity for teaching swimming and water safety in a town with so much open water. The swimming facilities should be designed for daily swimming by the children of the neighborhood, and refreshing quick dips by parents after a hot day at the office or house work. Swimming and
diving as sports would be performed at the Town Reservoir Beach, where night swimming under lights should also be available. Operation of neighborhood pools on this basis could be very economical. Bathing could be limited to a period such as 2:00 to 7:00 P.M. daily; 9:00 to 4:00 P.M. on Saturdays. This kind of a schedule would necessitate only one life guard who could be a Senior High School student.

No extensive bath house facilities would be required and the toilet facilities in the schools could be utilized. The program could be operated under the direction of the summer recreation director at the playground. This program is made possible by the fact that three of the six neighborhoods will have natural bathing places available, two of them in west Milton. Pope's Pond and Turner's Pond, when assured a continuous flow of fresh water in summer, can be developed at little cost into highly satisfactory swimming areas. Tucker School and Vose School neighborhoods should have small concrete pools developed in conjunction with the playgrounds.

The following is a plan for recreation development by neighborhoods:

1. Tucker School Neighborhood - Heavily trafficked streets passing through this neighborhood make it necessary to provide more than one playground. The section of the neighborhood east of the parkway is now adequately served by the Elliot Street
playground which should continue as an unsupervised auxiliary playground. The Brook Road playground is in reality an athletic field and should be so re-named. A section of the field should be developed for children as an auxiliary playground and small area of it fenced off as a tot lot.

Another tot lot, probably using the center of the block traversed by Chilton Park, should be developed in the triangle between the Parkway and Thatcher Street.

West of the Parkway the need for facilities is greater and at the same time more difficult to meet.

There are no playgrounds of suitable size west of the parkway at the present time. By far the best solution would be to enlarge the Tucker school playground as shown on Plate 11. (A playground could be established at Chever Street and Blue Hill Avenue, but this area is at the periphery, rather than the center of the area needing service). A small swimming pool should be constructed at a later date. Part of this area should be developed as a tot lot.

A strip park as a buffer strip between neighborhoods and a place for informal play, should be obtained to the south of Chever Street.
2. Turner's Pond Neighborhood: A beautiful park and playground can be worked out around Pope's Pond in conjunction with the new school. With a supply of fresh water assured in this pond, a limited amount of bathing would be feasible. The Mary C. Lane playground in this neighborhood is unfortunately so situated so as to serve only a limited number of families. It should be developed for informal and unsupervised recreation only.

3. Vose School or Town Center Neighborhood - There will be adequate room for a playground in conjunction with the proposed new school. An artificial pool should be installed at a later date. There is no need for a tot lot except in conjunction with the playground.

4. Pope's Pond Neighborhood - A park and playground development similar to that at Turner's Pond is proposed.

Community Recreation Facilities

The new athletic field in conjunction with the proposed Junior High School should serve for all community athletic facilities including Junior High School athletics. Winter skating should be developed at Pope's and Turner's Ponds.

Shopping

As pointed out in the survey report, West Milton cannot hope to develop a successful central shopping district, but
can rather look forward to the development of the neighborhood shopping facilities it needs. For best utility and attractiveness, those neighborhood stores should be planned and developed as a unified group with adequate and felicitious treatment of parking, street loading, and landscaping. The centers should, where possible, be planned to serve as a part of the neighborhood nucleus. They must be located on land where commercial development is feasible and probable. Conditions in two of the proposed neighborhoods will allow for the early development of new planned shopping centers. In the other two neighborhoods, existing conditions limit immediate prospects to something less satisfactory. Because of the differing conditions in the different neighborhoods, they will be discussed individually.

Tucker School Neighborhood: This area has a number of scattered stores all within a short distance of the school. There are five groceries including a fairly large chain store, and two drug stores. It is probably impossible to concentrate these scattered facilities in the near future, especially since there is no suitable vacant land in the central location. Over a long period of time, however, it may be possible to develop a small center near the school as suggested in Plate 11.

Turner's Pond Neighborhood: The off center shopping area at Central Avenue and Elliot Street has an adequate collection of stores and services with the exception of a supermarket. Its off-center location is partly justified by the distri-
bution of population densities and the street and commuting pattern. While it would be desirable to replace this center in a more open area where conditions of traffic and parking could be improved, the investment in buildings makes this course prohibitive. The eventual removal of the police station will make it possible to work out a fairly satisfactory design for the area with adequate parking and improved safety.

**Pope's Pond Neighborhood:** The needed shopping center for this area should be located somewhere around the central pond, both to take advantage of the view and because of the proximity of the other elements of the neighborhood nucleus. The best available location is on the Blue Hills Parkway at the intersection of the proposed road along Pine Tree Brook. The owners of Pope's Pond and the area selected are known to be interested in establishing a commercial use (restaurant) in the old ice house. They would undoubtedly be interested in establishing a neighborhood center in connection with the restaurant. If properly handled, the granting of such a zoning advantage might well favorably condition the price of the park and school site.

**Vose School Neighborhood:** The needed center for this neighborhood could best be located at the intersection of Highland Street and Canton Avenue. It is the only large enough piece of vacant land adjacent to the school and playground, is centrally located, and is well suited to
commercial development. Its proximity to the new hospital and the Town Center would bring extra business and increase its service to the community. Location of the various centers is shown in Plate 11.

It is recommended that the Milton Village Shopping Center be allowed to continue in its limited capacity, but not encourage to expand. Building of the expressways will remove considerable traffic from Randolph Avenue. Present amount of metered parking is apparently sufficient to the needs of the business community. All day parking of commuters could be reduced through control of the streets and the establishment of all day parking areas in the meadows across the river along the expressway. A more detailed plan for the Village should be worked out.

**Streets and Traffic**

While diversion of through traffic to the expressways will materially reduce traffic on many of Milton's local streets, it will in no measure completely solve the traffic problem. There will be considerable remaining traffic on many streets; part of which will be local traffic part residual through traffic that will choose for one reason or another not to use the expressways. The planning of school locations was worked out concurrently with the planning of streets so as to reduce the need for pedestrian crossing of busy streets to a minimum and to decrease the accident hazards at such regular pedestrian crossings as cannot be eliminated.
Street by street the following proposals are made:

**Brook Road:**

Traffic on Brook Road will be reduced considerably by the Boston-Fall River Expressway and the Neponset River Expressway. The latter will serve as a faster route to East Milton and Quincy. The all parkway route to Quincy and the South Shore should also remove considerable passenger car traffic. There is a large amount of local traffic on the street which will continue. The installation of a narrow medial strip to facilitate crossing is proposed with twenty-six feet of paving on either side.

**Peedsdale Road:** Every available means should be used to discourage through traffic on this street after the construction of the expressways. Trucking should be prohibited and shifted, together with as much other traffic as possible, to the somewhat longer Brook Road-Randolph Avenue route which does not pass through neighborhoods. Traffic heading north on Randolph Avenue should be encouraged to continue to Brook Road by the traffic oval proposed for the Peedsdale Road intersection. A parked center strip is proposed for the street to facilitate crossing. The proposed simplification of the Canton Avenue intersection will reduce accident hazards and make it possible to install a walk period in the cycle of the traffic light at that point. This improvement is very important in relation to the school planned adjacent to the library.
Canton Avenue: Route 135 which now brings considerable traffic through Milton on this street should be re-routed on the Neponset River Expressway. An alternate route for passenger cars will also be available in the all parkway route. Remaining local traffic on Canton Avenue will in time increase sufficiently to warrant the enlargement and completion of the traffic circle at Blue Hills Avenue and the widening and center stripping of the street between Blue Hills Parkway and Reedsdale Road. It is not necessary to retain Canton Avenue North-East of Reedsdale Road as a through street, nor is it desirable from a neighborhood standpoint. Various modifications have been proposed to discourage traffic.

Randolph Avenue: While the expressways will also relieve traffic on Randolph Avenue, that street will also continue to carry considerable traffic. Zoning on land fronting the avenue should be continued at a minimum of half acre to keep down border friction. Creation of the traffic island at Reedsdale Road has already been mentioned. The elongated island between Pleasant Street and Reed Street will improve both intersections and greatly facilitate access for the people of East Milton to the Town Reservoir and Park.

Central Avenue: Central Avenue will continue as an important feeder street and should have a median strip installed opposite the school and park to facilitate pedestrian crossing.
Thacher Street: It is recommended that this important feeder street be replaced due to basic inadequacies. Since it will be necessary to replace the bridge over Pine Tree Brook, it is recommended that the new bridge be erected at Wendell Park, to take advantage of the divided way South of Pine Tree Brook. North of the brook the traffic will divide among Thacher Street, and Audobon Road. A one way traffic system could be worked out to facilitate movement and increase safety. It is believed that this system, which is less direct than Thacher Street, will succeed in diverting traffic to the more safe Blue Hill Parkway and Brook Road routes. Some diversion along the Pine Tree Brook Drive can also be expected.

Blue Hill Avenue: While most of the through traffic will be removed from this road by the proposed expressway, it will undoubtedly continue to carry a limited amount of through traffic and will continue as an important feeder street serving Southwest Milton. The street is most dangerous and disruptive in its passage through the Tucker School neighborhood. The plan provides for diverting this traffic to the border street paralleling the new Neponset Expressway by making that route the line of least resistance as shown on Plate 11.

Blue Hills Parkway: The parkway will undoubtedly carry more traffic in the future than it does today. It will be
necessary to continue the police protection for school crossing at the Brook Road intersection. The wide medial strip on the parkway lessens the danger of crossing considerably. A traffic light at the Pine Tree Brook Parkway, operating on week days will improve safety of pedestrian and automobile crossing.

Elliot Street: There is seemingly no immediate solution to the problem of heavy traffic on this 40' street. When and if the spur line serving the Baker Chocolate Mills can be closed across Central Avenue, it may be possible to place entrance and access ramps to the Neponset Expressway at that point. The expressway route from Central Avenue to Mattapan thus provided would undoubtedly take considerable traffic from Elliot Street. Following completion of the expressway program, however, a traffic survey should be taken on Elliot Street to see if this measure would be of sufficient relief to warrant the cost.

Proposed Pine Tree Brook Parkway: This street is necessary to provide adequate access to the community center and to give the Pope's Pond area a more direct access to the High School and Central Avenue. The drive would open up the lovely wooded banks of the brook in this section to a large number of motorists and pedestrians. It should also reduce traffic in the residential section just north of the brook.
Community Facilities: Because of the long distance between the two parts of town, it is recommended that community buildings with recreation facilities be established in each section rather than one building for the entire town. The building for East Milton should be integrated with the Junior High School so that shop, auditorium, and athletic facilities could be available for use by both the Junior High School students and the adults of the community. Indoor swimming facilities should be provided in the community center. Proximity to the High School would make the West Milton Pool available for High School use also.

Development of the Junior High School and West Milton Athletic Field have already been discussed. For most successful use the three should be developed as a unit.

Development of the Reservoir for Town and Metropolitan Recreation

As noted in the discussion of flood control measures, the proposed reservoir will create excellent opportunities for recreation. The combination of wooded and hilly shoreline with the large body of clear water will present beautiful vistas and opportunities for a wide variety of sports and out-of-doors activities. The long shore line will provide ample room for the Town, the Boys Scouts, and the Metropolitan District Commission.

It is recommended that the Town retain for the use of its people the North shore of the lake between Randolph
Avenue and the Dam, a stretch having over a mile and a half of shore line. The land should run back from the shore far enough to provide ample wooded area for picnicing and general park use. The rugged area between the lake and the Town Farm should be purchased, and used as a Town Forest to further diversify the recreational facilities. Total park and town forest area, exclusive of water would be 205 acres. It is important that good access facilities to the park be furnished from all parts of the Town. For this purpose it is recommended that Governor Stoughton Lane be carried South and East to connect with Reed Street. In addition to giving access, the road would serve as the boundary of the park. It is further recommended that Wendell Park be extended, as part of the subdivision of the land South of Canton Avenue, to the beach and recreation area. These proposed connections are shown on the development plan map, Plate 11.

While development of the park should be undertaken only with the assistance of competent landscape architects, a general scheme of utilization has been prepared to show the possibilities of the site. The beach, which will be the focal point of activities is suggested for the area with a southwest exposure, so as to catch the evening sun. The rising land above the beach would have a long view across the lake. The small cove to be north would serve as an excellent boat harbor for small boats. (It
would probably be desirable on a lake of this size especially in view of the surrounding high-class residence to bar motor-driven boats other than official craft.) A large level area to the east of the beach, while subject to flooding, would nevertheless be available during the summers for all kinds of field sports. There is an ample supply of excellent sites for picnic areas. Park drives have been laid out to provide access to these recreation areas.

Proper development of such a park would tremendously increase the advantages of living in Milton. Since facilities could be provided by the M.D.C. for the rest of the region at the other end of the lake, this park could be limited to the use of Milton residents and their guests through parking restrictions or other means.

M.D.C. Use

As part of the reservoir borders on the Blue Hills Reservation, and as water recreation in the Reservation is limited to the inadequate Houghton's Pond, it is recommended that the MDC develop a beach and recreational facilities at the southern end of the lake. To get an area that will receive the afternoon sun, and to enlarge its shoreline, it will be necessary for the M.D.C. to purchase additional land on the South shore extending nearly to Harland Avenue. Since this end of the lake is relatively shallow with very gradually sloping bottom, it will be necessary for the M.D.C. to do quite a bit of
stripping to secure necessary depth for their proposed beach. On the other hand, the removed material being rich in humus would probably have a good market value. It is entirely possible that there is a deposit of sand and gravel somewhere in the reservoir purchase area that would serve as material for the beaches.

The proposed parkway connection south of the lake will provide access to the beach area, and also open this little used corner of the Reservation to extensive use. There is ample room for parking and picnicing.

In order that the quality of the water at the two beaches may at all times be satisfactory, it is suggested that each be closed in with sheet-steel piling and a circulating water and chlorination system be established for each. Fresh water can be pumped in from an intake towards the center of the lake, chlorinated, and released into the swimming pools which would be kept at a higher level than the lake. The outfall through controlled openings in the pilings would be allowed to flow back into the reservoir.

In years when natural flow into the reservoir fails to keep the water sufficiently fresh, the M.D.C. could add water from its mains to the recirculated water. Thus the freshness of the pools and ponds would be assured even in the driest years. The addition of water would also insure a continuous flow of satisfactory water to the neighborhood swimming facilities in Pope's and Turner's ponds.
Other Town Facilities in West Milton

Town Center: The town center is well situated and there is no reason to move it from its present site. The following long range plan is offered for improving the center on its present site, somewhat enlarged. With the change of the old Vose School to town offices, the buildings in the town center will consist of the school building, the Town Hall proper, the Fire House, and the Library. While the library will be a neighborhood facility, it will also be the central town library. With the possible exception of the library, all the buildings should be replaced before the turn of the century. None of them have any architectural or historical value that would warrant their retaining. On the other hand, the churches, typically old New England structures, to flanking the center, should be preserved. The town police station, now to the rear of the Central Avenue shopping area should be moved to the town center within this period.

This plan calls for the creation, in about twenty-five years, of a new town office building on land to be purchased across the fire department from the Vose School. This new building would then contain all town offices except police and fire departments. Following the occupation of this building, Vose School should be razed and replaced with a new structure to house the five and police departments. As soon after as budgeting conditions permit, the Town Hall should be replaced by a large auditorium.
The three buildings should be conveniently grouped with adequate landscaping and sufficient parking.

Milton wide fraternal organization or similar clubs should be encouraged to occupy the remainder of the block.

The advisability of installing the often discussed central steam power plant near the new school should be thoroughly investigated, and if economically feasible, it should be installed at the same time as the new school. The plant could serve all public and quasi-public buildings in the center and the proposed neighborhood shopping center.
Utilities

Adoption of the proposed plans for west Milton would require certain modifications in the sewer and water systems, and would effect plans for the extension of these utilities to serve the newly developed areas. Creation of the reservoir, for instance, might make it desirable to re-route the water line now in that street around the western end of the reservoir. However most of the modifications would be in the direction of reduced requirements rather than increased, and there is no evidence of any need for a major change that would require major revision of the plans. Since the changes required are primarily technical matters, no effort has been made to include them in this thesis.

Basic plans for storm drains have already been discussed. The placing of storm sewers in new streets is again primarily a technical matter and has not been covered by this study.

Transit

The laying out of bus routes and schedules can also be done after completion of the plan and will not effect the physical layout. It would be desirable if busses could run from the collection areas in Milton direct to Ashmont without need for a change en route. It would also be very desirable if the Town Park at the new reservoir could be connected by bus, at least on Saturdays and Sundays with the areas of concentrated population in East and West Milton.
Plate 11 - A large map showing all the elements of the proposed plan is on file with the City Planning Department.

As stated above Plate 11 is not attached to this thesis. The map is not part of MIT's Archival theses collection.
APPENDIX A

Cost Computations, Reservoir Plan

Accurate computation of costs on the proposed dam would only have been possible after extensive field investigation including the taking of borings to determine sub-grade conditions. Since this was out of the question, the author used what could be expected to be difficult construction conditions. For instance, a concrete core wall was used, extending in the center of the valley approximately 15' below grade. While it is indeed possible that more expensive construction might be required, it is perhaps more probable that a less expensive type of core wall could be utilized. A preliminary design was prepared with technical help from qualified engineers and cost computed on that basis, unit prices being obtained from engineers on the basis of 1950, pre Korea, costs.

Preliminary estimated cost of the reservoir was as follows:

- Land 350 acres 250 $87,500
- Land clearance, permanent storage area 27,000
- Dam Construction 72,500 $187,000

Total estimated cost of the alternative plan is therefore:

1. Reservoir costs (not including recreation development) $187,000
2. Trout Brook diversion 1,500
3. Channel Improvements, Pine Tree Brook 109,000 $297,500
The differential between this preliminary estimate and the cost of the complete Turner plan at $264,000 is therefore only $34,000, or approximately 13%.
### Appendix A.

#### Peak Flood Flows at Central Avenue

**Pine Tree Brook (Present conditions)**

<table>
<thead>
<tr>
<th>Period</th>
<th>Storm in which flow is likely to exceed</th>
<th>Storm Rain inches</th>
<th>Entire Watershed Flow &amp; Storm Drains</th>
<th>Entire Lower Watershed Flow &amp; Storm Drains</th>
<th>Lower Watershed Flow after Drains Allowance</th>
<th>Allowance (a-b)</th>
<th>Lower Watershed Flow from Storm Drain Allowance (a-b)</th>
<th>Net Flow at (e + f)</th>
<th>Outfall Flow at Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 yrs.</td>
<td>6.7</td>
<td>60</td>
<td>300</td>
<td>240</td>
<td>120</td>
<td>180</td>
<td>10</td>
<td>190</td>
<td></td>
</tr>
<tr>
<td>50 yrs.</td>
<td>9.00</td>
<td>70</td>
<td>380</td>
<td>310</td>
<td>155</td>
<td>225</td>
<td>32</td>
<td>257</td>
<td></td>
</tr>
<tr>
<td>100 yrs.</td>
<td>10.9</td>
<td>80</td>
<td>460</td>
<td>380</td>
<td>190</td>
<td>270</td>
<td>55</td>
<td>325</td>
<td></td>
</tr>
<tr>
<td>Probable Maximum</td>
<td>16.6</td>
<td>100</td>
<td>700</td>
<td>600</td>
<td>300</td>
<td>400</td>
<td>75</td>
<td>475</td>
<td></td>
</tr>
</tbody>
</table>

#### II. Pine Tree Brook With Diversion of Upper Front Brook

<table>
<thead>
<tr>
<th>Period</th>
<th>Net Flow</th>
<th>Diversion of Upper Trout Brook</th>
<th>Net Flow Less Diversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 yrs.</td>
<td>190</td>
<td>30</td>
<td>160</td>
</tr>
<tr>
<td>50 yrs.</td>
<td>257</td>
<td>39</td>
<td>218</td>
</tr>
<tr>
<td>100 yrs.</td>
<td>325</td>
<td>47</td>
<td>278</td>
</tr>
<tr>
<td>Probable Maximum</td>
<td>475</td>
<td>75</td>
<td>400</td>
</tr>
</tbody>
</table>

Appendix A p.1

Peak Flow Calculations
### Peak Flood Flows at Central Avenue

#### (I) Pine Tree Brook. (Future Conditions)

<table>
<thead>
<tr>
<th>Period in which flow is likely to be exceeded</th>
<th>Storm Rain 24 Hr.</th>
<th>Entire Watershed Flow</th>
<th>Base Flow &amp; Storm Drains Allowance</th>
<th>Entire Lower Watershed Flow after Future Conditions</th>
<th>Lower Watershed F.C. plus base flow &amp; storm drain allowance (a + b)</th>
<th>Peak Outfall Net flow e + f</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 yrs.</td>
<td>5.2&quot;</td>
<td>500 cfs</td>
<td>80 cfs</td>
<td>420 cfs</td>
<td>168 cfs</td>
<td>248 cfs 37 cfs 285</td>
</tr>
<tr>
<td>50 yrs.</td>
<td>6.7</td>
<td>645</td>
<td>90</td>
<td>555</td>
<td>222</td>
<td>312 67 &quot; 379</td>
</tr>
<tr>
<td>100 yrs.</td>
<td>8.1</td>
<td>810</td>
<td>100</td>
<td>710</td>
<td>284</td>
<td>384 83 &quot; 467</td>
</tr>
<tr>
<td>Probable Maximum</td>
<td>12.0</td>
<td>1200</td>
<td>120</td>
<td>1080</td>
<td>432</td>
<td>552 100 &quot; 652</td>
</tr>
</tbody>
</table>

#### II. Pine Tree Brook With Diversion of Upper Trout Brook.

<table>
<thead>
<tr>
<th>Probable Maximum</th>
<th>(e) Net Flow (d)</th>
<th>(f) Diversion of Upper Trout Brook</th>
<th>(g) Net Flow Less Diversion e-f</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 yrs.</td>
<td>285</td>
<td>42</td>
<td>243</td>
</tr>
<tr>
<td>50 yrs.</td>
<td>379</td>
<td>55</td>
<td>329</td>
</tr>
<tr>
<td>100 yrs.</td>
<td>467</td>
<td>71</td>
<td>396</td>
</tr>
<tr>
<td>Probable Maximum</td>
<td>652</td>
<td>108</td>
<td>544</td>
</tr>
</tbody>
</table>

*Appendix A p-2*
## APPENDIX B

### Cost of Reservoir

**Land and Clearance**
- Land 350 A @ $250 = $87,500
- Clearance 270 A @ $100 = $27,000

**Structure**
- Stripping 300 cu. yds @ $1.50 = $450
- Excavating for core well 1000 cu. yds @ $3.00 = $3,000
- Handling water during construction = 4,000
- Rock excavation for core well 100 cu. yds @ $6.00 = 600
- Core wall 500 cu. yds concrete @ $40.00 = 20,000
- Drain structure with gate = 5,000
- Outlet structure = 15,000
- Earth fill, placed and compacted 8,000 cu. yds @ $1.00 = 8,000
- Grassing = 2,000
- Stone poring 600 cu. yds @ $1.50 = 900
- Miscellaneous Lumber = 1,000

**Calculated Construction East** = $59,950

**Contingencies 10% of Calculated Construction Cost** = $6,000

**Estimated Construction Costs** = $65,950

**Engineering Services (Boring-Plans-Supervision)**
- 10% of Estimated Construction Costs Total = $6,500

**Grand Total** = $187,000
BIBLIOGRAPHY


4. Ibid. p. 4


