***Good views toward central creek area and other features.
***Provides adequate access to the rest of the site.
***Loop road provides easy movement throughout site.
***Road generally follows topography.
***Provides connection between north & south sections.
***Provides entries on high points of Auburn Road.
***Provides access to natural site amenities.
***Main paths concentrate on flood plain area.
***Can bleed off main paths to connect all housing areas.
***Would provide central focus to site.
***Potential ponds (P) throughout flood plain.
***Various potential locations for clubhouse (CH) throughout creek area provide good views.
***Provide tennis courts (TC) near clubhouse (CH).
MEDIAN-DENSITY MULTI-FAMILY TOWNHOUSE CLUSTERS

* 640 UNITS
* 11.4 UNITS/ACRE
* 23.5 ACRES OPEN SPACE (41.8%)
SINGLE-FAMILY ZERO LOT LINE CLUSTERS

- 123 UNITS
- 3000-6000 SF LOTS
- 3.3 UNITS/ACRE
- 34.4 ACRES OPEN SPACE (62%)

LEGEND
- ROAD
- LOT LINE
- EXISTING TREES
- WATER

AUBURN MEADOWS
Community Developments
SCHEMATIC 4

LARRY KLOOZE
I.A 405-6
May 1988
Scale:
SINGLE-FAMILY ZERO LOT LINE/MULTI-FAMILY TOWNHOUSE CLUSTERS
- 244 UNITS (84+5F, 1201F)
- 5000-6000 SF LOTS
- 4.7 UNITS/ACRE
- 238 ACRES OPEN SPACE (42.3%)

LEGEND
- ROAD
- LOT LINE
- EXISTING TRENDS
- LATER
- PLAYGROUND
- GAZEBOS
- TENNIS COURT
- PATH
- FOOTBRIDGE
- TOWNHOUSE

AUBURN MEADOWS
Community Developments
SCHEMATIC 6

LARRY KLOOZE
LA 4056
May 1988
Scale:

1" = 100'
SINGLE FAMILY DETACHED AND ZERO LOT LINE/MULTI-FAMILY TOWNHOUSE CLUSTERS

- 52 UNITS (925-1,000 sq ft)
- 7,000-14,000 SF LOTS
- 3.4 UNITS/ACRE
- 28.8 ACRES OPEN SPACE (5.5%)

AUBURN MEADOWS
Community Developments
SCHEMATIC 7

LARRY KLOOZE
LA 405°6
May 1988
Scale:
LEGEND

- ROAD
- LOT LINE
- 2 TOWNHOUSE
- WATER
- EXISTING TREES
- PLAYGROUND
- GAZEBO
- PATH
- FOOTPATH
- TENNIS COURT
- CLUBHOUSE

SINGLE-FAMILY ZERO LOT LINE/MULTI-FAMILY TOWNHOUSE CLUSTERS

- 216 UNITS (1,280 SF, 13.3%)
- 3,000-12,000 SF LOTS
- 4.6 UNITS/ACRE
- 532 ACRES OPEN SPACE (41%)

AUBURN MEADOWS
Community Developments
SCHEMATIC 8

LARRY KLOOZE
LA 405-6
May 1988
Scale: 1"=100' N

SHEET 14 OF 18
LEGEND
- ROAD
- LOT LINE
- TOWNHOUSE
- WATER
- EXISTING TREES
- PLAYGROUND
- GAZEBO
- PATH
- FENCE
- TENNIS COURT
- CLUBHOUSE

SINGLE FAMILY DETACHED AND ZERO LOT LINE/MULTI-FAMILY TOWNHOUSE CLUSTERS
- 257 UNITS (17 SQ, 9015)
- 1000-1500 SF LOTS
- +6 UNITS/ACRE
- 23.7 ACRES OPEN SPACE (42%)
SCHEMATIC ANALYSIS

The schematics developed for this site show a progression from high-density to lower density community developments. This was done in order to get a feel for the maximum density conceivable on the site, and then work down to permitable densities and their varying arrangements on the landform.

Schematic #1

This schematic, using multi-family townhouses only, permits a glimpse of what the maximum density conceivable would look and feel like. With 1080 townhouse units (1200 sq.ft.) arranged on a grid (20 units per cluster), overall density is 19.3 dwelling units/gross acre (26 units/net acre). This plan utilizes the entire flood plain as an open space corridor and retains all of the existing mature vegetation. There are fingers of open space to the north and south of the creek corridor, and three separate vehicular entrances serve four zones of development. Overall, this would prove to be a very dismal and cramped living environment.

Schematic #2

This schematic also features strictly multi-family units, but here they are at a lesser density and somewhat clustered in groups. Medium density is provided by the 640 units, with eighteen units per cluster. The gross density is
11.4 units/gross acre (19.5 units/net acre). This plan utilizes three entries, and the layout is more sensitive to the landform. The roads follow the topography, and the creek corridor/flood plain is set aside for open space. Open space is allowed to bleed into the northern and southern sectors from the creek corridor, and all of the existing vegetation is retained. The major drainage swales have been preserved for the most part, and each individual cluster of townhouses has an opening into the open space system from the parking area. With the planting of additional vegetation, each cluster could be screened from its neighboring cluster, adding more privacy to the overall community. The creek has been expanded to include three ponds, which would add increased visual interest to the open space corridor.

Schematic #3

This schematic utilizes single-family small lot clusters which could provide detached or attached housing with a zero lot line option. There are 118 lots of 6000 to 8000 square feet each which provide a very low density of 2.1 units/gross acre (5.2 units/net acre). Open space acreage totals 33.5 acres (59% of the site), and each cluster is surrounded by the open space system. Almost every lot has direct access to the open space system which bleeds its way throughout the site and acts as a buffer between the clusters and the neighboring residential areas. This system could provide excellent opportunities for a network of paths which would connect all clusters with the open space.
corridor. All of the existing vegetation is retained, and it separates the site into four zones of development. Two entries are utilized, and the clubhouse is located at the northern entry, with excellent views of the creek corridor. As before, ponding has been used for visual interest.

Schematic #4

This plan is similar to the previous schematic in that it provides for single-family zero lot line clusters using small lots. The lot sizes range from 3000 to 6000 square feet and are buffered by open space surrounding each cluster of lots. Providing 183 lots, the gross density is 3.3 units/acre (8.5 lots/net acre). There are 34.9 acres of open space, which represents 62% of the site. Because of the ample amounts of open space threading throughout the site, 99% of the lots have direct access onto the open space system. This could provide easy access to the main creek corridor through the use of a path system. Most of the existing mature vegetation has been preserved, and ponding of the creek provides visual interest. This plan utilizes two separate entries with no lot frontage on the collector roads.

Schematic #5

This schematic also deals with single-family zero lot line clusters, with lot sizes of 4000 to 8000 square feet. There are 223 lots which provide a gross density of 4.0 lots/acre (6.4 lots/net acre). Open space acreage totals
21.5 acres (38.2% of site), with major open spaces bleeding into the northern and southern sectors. The lot clusters are situated back to back, but access to the open space system is provided by openings to the collector roads and/or cul-de-sacs. Two entries provide access to eleven cul-de-sac clusters and some collector road frontage lots. Some of the clusters utilize shared driveways for the more remote lots. Most of the existing vegetation is retained, and there are some wooded lots provided.

Schematic #6

This schematic features a mix of single-family zero lot line lots and multi-family townhouse clusters. The townhouse clusters are isolated in two groups on the western edge of the site. Single-family lots range from 5000 to 8000 square feet. There are a total of 264 units (144 single-family lots and 120 multi-family townhouses), and the density is 4.7 units/gross acre (8.1 units/net acre). The flood plain is again utilized for the open space corridor, with open space fingering into the northern and southern sectors of the site. Access to the open space system from the cul-de-sacs is provided by openings from the fingers onto the collector roads and/or cul-de-sacs. A path system is shown linking the housing areas with the main open space corridor. Certain amenities have been provided on this plan, such as playgrounds and gazebos situated off the path system throughout the housing areas, tennis courts along the western edge of the open space corridor, and a clubhouse at
the northern entry with good views across the creek/open space corridor. Two entries are used, and the collector road forms a loop from the northern entry to the southern entry. This provides a direct vehicular link between the northern and southern sectors. Pedestrian links are provided via two bridges that span the creek to connect the northern and southern path systems. Most of the existing vegetation has been preserved, and some wooded lots are provided. Ponding of the creek provides visual amenities to the community.

Schematic #7

This plan is a mix of single-family detached/zero lot line lots and multi-family townhouse clusters. The single-family lots range in size from 7000 to 14000 square feet. There are 192 units total: 92 single-family lots and 100 multi-family units. Gross density is 3.4 units/acre (7.0 units/net acre). The open space system provides a buffer to the north and east of the northern sector. Total open space acreage is 28.8 acres (51% of site), with the open space system providing a network of paths that meander throughout the site. The clubhouse and tennis courts have been combined in a central location and are easily accessible from the housing areas via the vehicular and pedestrian circulation systems. Two entries are utilized, and the collector road forms a loop from the northern entry to the southern entry. Most of the mature vegetation is retained, and there are some wooded lots. Ponding of the creek is again used for visual interest.
Schematic #8

Single-family zero lot line clusters and multi-family townhouse clusters are used on this plan. There are 261 units provided: 128 single-family lots and 133 multi-family townhouses. The single-family lots range from 3600 to 12000 square feet. Gross density is 4.6 units/acre (7.9 units/net acre). There are 23.2 acres of open space (41% of site) fingeringing throughout the site, connecting the housing clusters to the main open space corridor. The path system provides easy access to the creek corridor and links the northern and southern sectors of the site together. The vehicular loop road also links the site together. The clubhouse and tennis courts are centrally located with good views of the creek area, and the multi-family units are located near the entries to reduce traffic flow throughout the site. Most of the mature vegetation has been retained.

Schematic #9

This plan features single-family zero lot line/detached lots (4000 to 16000 square feet) and multi-family townhouse clusters. The density is 4.6 units/gross acre (7.9 units/net acre) with 117 single-family lots and 140 multi-family units. The zero lot line clusters are segregated away from the larger single-family lots, and the multi-family units are located near the entries. There are two loop roads which join the northern and southern sectors of the site. The open space system consists of 23.7 acres of open space (42% of
the site) that fingers throughout the site. The path system pulls the site together by bridging the creek in various spots. Most of the mature vegetation is retained, and there are some wooded lots.

Schematic #10

This, the final schematic, is a culmination of various previous ideas and layouts. It provides 231 units, of which 101 are single-family zero lot line lots in clusters and 130 multi-family townhouse units in clusters. The gross density is 4.1 units/acre (8.8 units/net acre) with 4000 to 12000 square foot single-family lots. There are 30.1 acres of open space (46.5% of the site) that bleed throughout the housing areas, surrounding each housing cluster, connecting them to the creek corridor via a path system. Playgrounds and gazebos are provided along the path system for family outings. Building footprints have been provided to show typical cluster arrangements. The smaller single-family lots are separated from the larger lots by the road network, and the multi-family units are near the entry points to reduce vehicular traffic through the site. The clubhouse complex is centrally located, adjacent to the loop road that connects the northern and southern sectors for easy access. Views along the creek corridor are maximized: both entries have good views over the creek areas, and the clubhouse is situated so that it can be seen from the northern entry (the main entry). Various ponds have been utilized for visual interest, and most of the existing vegetation has been
retained.
## Schematic Cost Comparison

<table>
<thead>
<tr>
<th>Schematic plan</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>7</th>
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<th>9</th>
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<tbody>
<tr>
<td>Number of units</td>
<td>1080</td>
<td>640</td>
<td>118</td>
<td>183</td>
<td>223</td>
<td>264</td>
<td>192</td>
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<td>257</td>
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<td>N/A</td>
<td>6600</td>
<td>4000</td>
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<td>Acres of dev't</td>
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<td>32.8</td>
<td>22.8</td>
<td>21.4</td>
<td>34.8</td>
<td>32.5</td>
<td>27.5</td>
<td>33.1</td>
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<td>26.2</td>
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<td>Acres of open space</td>
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<td>23.5</td>
<td>33.5</td>
<td>34.9</td>
<td>21.5</td>
<td>23.8</td>
<td>28.8</td>
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<td>% open space preserved</td>
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<td>41.8</td>
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<td>62</td>
<td>38.2</td>
<td>42.3</td>
<td>51</td>
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<td>46.5</td>
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<td>Net density (du/na)</td>
<td>26</td>
<td>19.5</td>
<td>5.2</td>
<td>8.5</td>
<td>6.4</td>
<td>8.1</td>
<td>7</td>
<td>7.9</td>
<td>7.9</td>
<td>8.8</td>
</tr>
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<td>Gross density (du/ga)</td>
<td>19.2</td>
<td>11.4</td>
<td>2.1</td>
<td>3.2</td>
<td>4</td>
<td>4.7</td>
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<td>Linear feet of roads</td>
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<td>6780</td>
<td>4680</td>
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<td>5640</td>
<td>7580</td>
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<td>7000</td>
<td>7600</td>
<td>7720</td>
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<td>Linear feet/lot/unit</td>
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<td>39.7</td>
<td>28.6</td>
<td>25.3</td>
<td>28.7</td>
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<td>26.8</td>
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<td>7900</td>
<td>8000</td>
<td>6500</td>
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</table>
In this project, the creek/flood plain area is rather extensive. It is also centrally located on the site and provides good visual character to the area. Therefore, it is appropriate that this area be chosen as the open space focal area of the community. It has been developed to provide both passive, leisure activities as well as active recreational features. There is a variety of terrain to be utilized for the passive activities, such as walking, jogging, and bicycling, as well as open space play. The higher areas of the terrain offer excellent views of the creek area, and the existing vegetation divides the creek corridor into smaller parcels. These smaller parcels suggest different zones of activity: the western area is composed of gently sloping to flat terrain (suitable for open space play and ponding); the central area combines a higher ridge thrusting into the flood plain (suitable for overlooking the creek area); and the eastern area provides steep slopes adjacent to an extensive flood plain (suitable for views of the corridor and ponding).

Description of the corridor development will begin at the western edge. Existing vegetation provides screening from the residential area adjacent to the west. Vegetation has been added to this area to provide three separate areas. The two western-most areas will remain in their present topography to be used for open space play areas. The third area, next to the creek, will be excavated to provide a
large pond with a twisting shore line. Vegetation (both deciduous and coniferous) will partially surround the pond, and a rock out-cropping will be added to a section of the shore line for visual character. The other side of the creek, a steep slope, will continue to support the existing vegetation that is present.

As the creek winds around the bend of the intruding ridge, it will pass under the road that crosses the creek. At this point, the creek will flow over a small dam and under a footbridge which straddles the creek between two heavily planted extensions of the bridge. The vehicle bridge will span between two pair of semi-circular planting beds within retaining walls. The eastern semi circles will continue toward the east; it is this portion that supports the footbridge. The semi-circular retaining walls will contain a ground cover of flowers accented by small weeping trees.

The road rises south up the ridge toward the clubhouse complex. This complex includes three tennis courts, a playground and adjacent gazebo, a trellis that connects the paths and parking areas with the clubhouse, a swimming pool and hot tub with a two-level deck, and the clubhouse. The clubhouse will house the community association offices and a party/gathering room for the residents of the community. There will also be ample parking provided in two separate areas (36 parking stalls). From the clubhouse and its decks, visitors will be able to look down toward the flood plain area and enjoy its rolling terrain and steeper slopes. A
short distance from the clubhouse, a path will lead to a gazebo perched upon a rock outcropping in a second pond. The views from the gazebo will include a fountain, extensive vegetation on the opposite steep slope, the extended portion of the vehicular bridge to the west, and some open space.

Further to the east, another footbridge will cross the creek, and the creek will again be expanded into another pond. This pond will be entirely surrounded by vegetation except for a small area adjacent to Auburn Road which will allow views into this area while travelling by on the access road. To the northeast, the main entrance to the community will enter at the high point along Auburn Road. An intensively planted area will surround the entrance signage. These signs consist of two arcs: the longer arc is in front and its height increases toward the entrance; the shorter arc, which is behind the longer arc, continues to rise to a point in the center of the first arc. This is where the community logo and name will appear. Ornamental and evergreen trees will provide the backdrop for the signage.

For people entering the site at the north entrance, once past the entrance views will be shifted towards an opening in the tree-lined avenue. Through this opening, visitors will be able to look down a slope, across open space and a pond, and up another slope to the clubhouse complex in the distance. This view will be interspersed with a variety of vegetation and terrain and will provide an exceptional view of the open space corridor.

The entire corridor is held together with a path system
that circulates throughout the corridor area (and into the housing clusters). This path system crosses the creek at three separate locations and runs adjacent to each pond and open space. It will also disappear into wooded areas only to reappear in another section of the corridor. Many portions of the pond's shoreline are heavily vegetated with a variety of trees, especially evergreen, that provide a backdrop to some of the finer views across the ponds.
ENTRY SIGNAGE

VIEW FROM NORTH ENTRY ACROSS OPEN SPACE CORRIDOR
BIBLIOGRAPHY


SHRUB SUITABILITY

GROUP 1: Washtenaw (Wh) soils
Arrowwood
Coralberry
Crabapple, Siberian
Cranberry, Highbush
Currant
Dogwood: Gray, Red-osier & Silky
Honeysuckle: Amur & Tatarian
Nannyberry
Plum, wild
Rose, Multiflora
Wayfaring Tree
Willow, Purple-osier

GROUP 2: Blount (BmA, BmB) soils
Arrowwood
Blackberry
Coralberry
Cranberry, Highbush
Dogwood: Gray, Red-osier, & Silky
Honeysuckle: Amur & Tatarian
Nannyberry
Plum, wild
Raspberry
Rose, Multiflora
Wayfaring Tree
Willow, Purple-osier

GROUP 3: Eel (Es) & Morley (MrB, MrB2, MrC2, MsD3) soils
Autumn Olive
Blackberry
Blackhaw
Cherry, Manchu
Coralberry
Crabapple, Siberian
Cranberry, Highbush
Currant
Dogwood: Gray, Red-osier, Roughleaf, & Silky
Hazelnut, American
Honeysuckle: Amur & Tatarian
Honeysuckle, Tatarian
Nannyberry
Plum, wild
Raspberry
Rose: Multiflora & Rugosa
Tulipbush

(U.S. Department of Agriculture, 1969)
TREE SUITABILITY (Woodland Study)

Preferred Species For Existing Stands:

GROUP 1: Morley (MrB, MrB2, MrC2) soils, excluding MsD3
    Red & White Oak
    Sugar Maple
    Tulip-Poplar
    Black Walnut
    White Ash
    Basswood
    Black Cherry

GROUP 2: Blount (BmA, BmB) soils
    Soft Maple
    White Ash
    Bur Oak

GROUP 3: Bel (Es) soil
    Tulip-Poplar
    Cottonwood
    Soft Maple
    Sycamore

GROUP 4: Washtenaw (Wh) soil
    Soft Maple
    Pin Oak
    White Ash

GROUP 8: Morley (MsD3 only) soil
    Tulip-Poplar
    White, Red, & Bur Oak

Preferred Species For Planting In Open Spaces

GROUP 1: Morley (MrB, MrB2, MrC2) soils, excluding MsD3
    Red & White Pine
    Tulip-Poplar
    Black Walnut

GROUP 2: Blount (BmA, BmB) soils
    White Pine
    Soft Maple
    White Ash

GROUP 3: Bel (Es) soil
    White Pine
    Cottonwood
    Black Locust
    Black Walnut

GROUP 4: Washtenaw (Wh) soil
    Only naturally regenerated species

GROUP 8: Morley (MsD3 only) soil
    White Pine

(U.S. Department of Agriculture, 1969)
RS-1 DISTRICT (3-6-5)
Purpose: provide a variety of areas for single family developments while offering maximum design flexibility to the extent that each area is an attractive, stable and orderly environment.
Permitted Uses: dwelling, one family detached.

RS-2: TWO-FAMILY RESIDENTIAL (3-6-6)
Purpose: medium density...provide for a living environment commonly associated with two-family dwellings. Typical housing types would include single family attached units and two-family dwellings.
Permitted Uses: RS-1, one-family dwelling attached, two-family dwelling.

RS-3: MULTIPLE FAMILY (3-6-7)
Purpose: ...permit multiple residences in an urban environment where compatibility with surrounding land uses is maintained and all of the facilities necessary for urban living are provided.
Permitted Uses: RS-2, ...office for the conducting of business incidental to the...project, multiple-dwellings and multiple-group dwellings.
Design Standards: (1)...no building shall be closer than 25 feet to the adjacent project boundary line and within 50 feet of a public right-of-way line; (2)...45% of the net site area shall be placed in recreation space of which 120 square feet per dwelling shall be developed recreational land. Within multiple-family dev'ts, required yards may be included as undeveloped recreation space.

PLANNED RESIDENTIAL DISTRICTS (3-6-9)
Purpose: ...to encourage innovative dev't of residential communities and offer developers of land the maximum amount of flexibility in design and dev't.
Permitted Uses: RSP-1 (Planned Single Family); RSP-2 (Planned Two Family); RSP-3 (Planned Multiple Family); RSP-MH (Planned Manufactured Housing).
Design Standards: ...maximum permitted density per acre: RSP-1: 5.25 dwelling units/gross acre, RSP-2: 6.8 du/ga, RSP-3: 22.0 du/ga;
Recreational Space:
RSP-1, RSP-2: recreation space shall be provided at a rate of 750 sqft/dwelling.
RSP-3: 45% of the net site site area shall be maintained in recreation space, of which 120 sqft/dwelling shall be developed recreational land.
DEVELOPMENT PLAN DESIGN STANDARDS (3-7-2)

Environmental Design: (1)...encourage preservation of natural site amenities and to minimize the disturbance to the natural environment.
(2) Existing trees and other natural features shall be preserved whenever possible. The location of these features must be considered when planning common open space, location of buildings, underground services, walks, paved areas, and finished grade levels.

Recreation Space: RSP, RS-3: purpose of providing this space shall be to meet the immediate and future recreational needs of the dev't's residents in a neighborhood setting. Recreation space may be provided in a centrally located site, in distinctly separate sites, as connecting links between separated activity areas, or adjacent to other existing or proposed recreation spaces. Space intended for limited recreational use (golf course)...shall have a maximum of three-fourths of said space utilized in meeting the recreation space requirements of the total dev't.

OFF-STREET PARKING (3-2-3)

Minimum Requirements: each automobile parking space shall not be less than 180 sqf. in area;
multiple-family dwelling: at least one and one-half parking spaces /dwelling unit;
single-family or two-family: at least two (2) parking spaces for each dwelling.

Parking Area Improvement (3-2-5): where off-street parking adjoins an RS or RSP district, a solid wall, compact evergreen screen, hedge, uniformly painted board fence, or earth mound shall be erected and maintained between such land and the adjacent district....the screening element shall be at least five (5) feet and not more than eight (8) feet in height.

Multiple Family Housing (3-2-7): parking areas may be located in any yard except the required front yard or required side yard facing the street.

Parking Standards (3-7-2): Parking areas shall be screened from adjacent non-related structures, roads and traffic arteries with plantings, earth berms, walls or changes in grade....shall be adequately lighted

ESTABLISHED HEIGHT LIMIT (3-8-1):
RS-1, RS-2: 25 ft. max.
RS-3: 50 ft. max.
LOT AREA REQUIREMENTS (3-9-1):
Minimum width, front building line:
RS-1, RS-2, RS-3: 50 ft.
Minimum net lot area (sqft):
RS-1, RS-2, RS-3: 6,250
Lot area for each dwelling:
RS-1, RS-2, RS-3: 1 dw.: 6,250, 2 dw: 5,000
RS-3: 3 dw: 4,000, 4 dw: 3,500

YARD REQUIREMENTS (3-10-1)
Front Yard Depth (feet):
RS-1, RS-2, RS-3: equal to one-half the width of the street
r.o.w...not less than 30 ft. and need not be more than 60
ft.
RS-1, RS-2 if recreation space provided...: 30 ft. minimum
unless said front yard adjoins the circular portion of a
cul-de-sac street in which case a 25 ft front yard depth is
permitted.
Side Yard Minimum width:
RS-1,2,3 without community recreation space: 10% of lot
width or 15 ft which ever is less.
RS-1,2 with recreation space: 7 ft.
Aggregate width of both yards:
RS-1,2,3 without community recreation space: 25% of lot
width or 35 ft whichever is less.
RS-1,2 with recreation space: 14 ft.
Rear Yard:
RS-1,2,3 without recreation space: 25% of lot depth or 25 ft
whichever is less.
RS-1,2 with recreation space: 25% of lot depth or 25 ft
whichever is less unless there is abuting common recreation
space...then a 15 ft depth is permitted.
Multiple-Family Dw'ts containing Five or more dwellings:
(1)...Two stories or less:
minimum distance from front or rear between adjacent
buildings--45 ft.
minimum distance from side of building to front or rear of
adjacent building--35 ft.
minimum distance between sides of buildings--25 ft.
(2) All structures within and adjacent to the boundary lines
of an RS-3 or less district or adjacent to either an A or
RS-1 district shall meet the minimum requirements of
A.C.C.3-10-1 for those sides abuting the boundary, except
that the maximum required side yard shall be 25 ft.
(3) All structures adjacent to a lot line abutting an RS-3
shall conform to the minimum side yard of 10% of the
proposed or actual lot width -- 15 ft. maximum.
GENERAL PROVISIONS (3-10-2)
Other Specified Plantings or Structures:
Fences, walls or hedges may be permitted in any yard, or along the edge of any yard. The height of fences, walls and hedges shall not exceed eight (8) ft in any side or rear yard. No fence, wall or hedge along the side or front of any front yard, or in front of the side building line of a corner lot shall be over two and one-half feet in height. However, fences that do not create a visual or physical barrier (i.e. split-rail fence) and whose purpose cannot serve any physical function other than for decoration or aesthetic appeal, may be constructed up to three and one-half feet in height within the front and side yards of a front yard. Fences within RSP district may be exempt from the above requirements.
Corner Visibility: no fence, wall, hedge, planting or other obstruction to vision in excess of three feet but less than eight feet above ground level shall be erected on that part of a corner lot that is included between the lines of intersecting street r.o.w.s and a line intersecting them at points 25 ft from intersection of the street lines (forming a triangle).

MINIMUM GROUND FLOOR AREA (3-11-1)
RS-1, 2, 3 and RS-P: ground floor one story -- 672 sqft; more than one story -- 480 sqft.

STREET SYSTEM (4-3-2)
Minimum right-of-way: Local, low volume street -- 50 ft.
Dead-End Street: No permitted dead end street shall provide principal frontage to more than 20 lots... shall terminate in a circular right-of-way with a minimum diameter of 100 ft. The street shall terminate with a paved turn-around with a minimum outside curb diameter of 75 ft.

BLOCKS (4-3-3)
Length: Blocks shall not exceed 1,320 ft in length unless unusual circumstances justify a greater length.
Width: Whenever possible, blocks shall be of sufficient dimension to allow two tiers of lots of appropriate depth.

LOTS (4-3-4)
Side Lines: ... shall be at right angles to straight street lines and radial to curved street lines.
EASEMENTS (4-3-5)

Easements: Where alleys are not provided, easements shall be provided for utilities, sewers and storm drains...located along rear or side lot lines...minimum width of 14 ft (7/lot)...if within a lot...minimum width of 14 ft shall be provided...proper continuity from block to block.

Drainage Provisions: In order to protect stream banks...open drainage easements shall be provided as follows: (1) not less than 30 ft in width beyond the top of one bank of any legal open drain and not less than 5 ft in width beyond the top of the second bank...(2) no open drainage easement shall be less than 50 ft in width or shall be other than offset as indicated immediately above;(3) No trees or permanent structure above grade, including...utility, shall be permitted in any open drainage easement...(4)...fences, shrubs, or bushes...are permitted within easement only if not within 5 ft of the top of bank.

STREETS (4-4-1)

Minimum width, Local Street: two-way - 27 ft including curbs, 22 ft if curbs not used;
one-way - 20 ft incl. curb, 18 ft if no curb.

MISC.

Storm Sewers (4-4-5): An adequate storm water system with surface inlets shall be installed....

Recreation Space (4-4-6):...shall be provided...wherein the minimum net lot area is less than 12,000 sqft...at the rate of 750 sqft per dwelling unit.
The Basic Detached House — This is the most common housing type in America today. It is also the most expensive because of its excessive requirements for land, roads, and utility extensions. It is normally occupied by one family and situated on a fee simple lot with no structural connections to adjacent units. The majority of detached housing has been developed at a density of three dwelling units per acre, or less.

Today both lots and houses are being reduced dramatically in size to keep selling prices in line with the consumers’ financial resources. How long can this trend continue and still meet basic family needs? It is this question that prompted the exploration of alternative house types and lot arrangements that follow.
The Zero Lot-Line House — This type is distinguished by the location of one wall on a side property line. This arrangement provides for better utilization of the site for outdoor living space. House design alternatives include conventional detached houses (with slight modifications), the patio house and atrium models. Side, rear, and occasionally front yards are enclosed by walls to form a garden court. These walls add to the overall site development costs and can produce additional site grading problems if the land is not generally flat. When used in combination with narrower streets, smaller lots and smaller units at higher densities, these costs can be offset. In spite of the possible difficulties, the zero lot line is an attractive and efficient alternative when higher densities are used to reduce land costs.

(National Assn. of Home Builders, 1982)
ATTACHED single-family houses are just that — individual houses that are joined. While the differences between single-family detached, attached and townhouses are subtle, and the concepts often overlap, the discussion of townhouses has been omitted because of the magnitude of information available in other, more specialized documents. Attached single-family houses make it easier to reduce roads and utility runs. They can also provide higher densities, smaller lot sizes, lower per-unit land costs, usable open space, and conserve sensitive natural resources.

One strong factor working against the attached single-family house is the buyer’s attitude. Families with young children prefer detached housing because of the sense of privacy and more usable exterior space adjacent to the dwelling unit. While these requirements for families may not change, the zooming costs of land and building will force the buyer to look for more affordable alternatives. Through more sensitive planning and design, attached single-family houses can become a more acceptable option for these families. The three basic types of attached single-family houses are (1) the duplex, (2) the triplex, and (3) the quadplex.

This study considers the quadplex as the cut-off point for the maximum number of attached units. Townhouses generally have more than four attached units and are sometimes associated with multi-family development.

(DUPLEX UNITS WITH ATTACHED GARAGES)

(National Assn. of Home Builders, 1982)
## Residential Streets

<table>
<thead>
<tr>
<th>Street Type</th>
<th>Pavement Width</th>
<th>R.O.W. Width</th>
<th>General Function</th>
<th>On-Street Parking</th>
<th>Driveways</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector</td>
<td>36'</td>
<td>40'-50'</td>
<td>Provides 2 moving lanes, on-street emergency parking lanes</td>
<td>Emergency only</td>
<td>Major entrances only to multi-family or similar developments</td>
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<tr>
<td>Subcollector</td>
<td>26'</td>
<td>30'-40'</td>
<td>Provides one freely moving lane even where parking occurs on both sides</td>
<td>Limited to single-family housing fronting on street, minimize frontage on a subcollector whenever possible</td>
<td>Minimize driveways and frontage of housing on subcollector</td>
</tr>
<tr>
<td>Cul-De-Sacs</td>
<td>20'</td>
<td>24'-30'</td>
<td>Provides parking on one side with alternating vehicular traffic flow</td>
<td>One side only, maximize off-street parking</td>
<td>Up to 20</td>
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<tr>
<td>Short Loop Streets</td>
<td>(12-20 dwellings)</td>
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</tr>
<tr>
<td>One-Way Loop or Short Cul-De-Sac</td>
<td>18'</td>
<td>20'-28'</td>
<td>Provides access for the largest truck if cars are parked properly</td>
<td>One side only, maximize off-street parking</td>
<td>Up to 7</td>
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<tr>
<td>(5-7 dwellings)</td>
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</table>

Refer to *Residential Streets*, pages 30-33 for more specific information on pavement widths and R.O.W. widths

*(National Assn. of Home Builders, 1982)*
**On-Street Parking** — Three options exist for providing on-street parking:

1. parking on one side of the street;
2. parking on both sides of the street; and
3. parking bays

Only parallel parking should be considered on minor residential streets with the exception of cul-de-sacs. Angle parking can be accommodated in the center of a cul-de-sac if it is difficult to obtain a desirable off-street parking ratio.

**Off-Street Parking** — Off-Street parking minimizes the need for parking lanes in the street. All residential occupant parking should be off-street. Only visitor parking should overflow onto the street. One-third of all American families own two or more cars. Factors that determine the appropriate off-street parking facilities necessary, include: family size and ages; family income level; population density per acre; proximity to and type of public transportation; and schools and shopping.

In a well-planned community, parking should not occur on arterial and collector streets. Adequate off-street parking must be provided for schools, shopping centers, employment complexes and other similar uses. While parking may occur on subcollector and other minor residential streets, the relative safety on these streets can be enhanced by increased visibility. Children darting between parked cars and cars backing out of driveways between parked cars are factors most effected by reduced sight distance.

(National Assn. of Home Builders, 1982)
PEDESTRIAN CIRCULATION

Walks and Paths — The complete separation of vehicular and pedestrian circulation systems is usually desirable. In order to achieve reasonable pedestrian access for each residence, three different types of sidewalks or paths can be utilized.

1. Walkways within the residential properties to provide access to parking and refuse disposal areas.
2. Local paths or sidewalks connecting dwelling units and serving immediate common services such as “gang” mail boxes.
3. Walkways connecting residences with commercial and community facilities, schools, and recreation.

Sidewalks along some residential streets are necessary and desirable. The basic test of need should be expected use and sidewalk relationship as an element of a functional pedestrian system. Realistic evaluation often will reveal sidewalks on one or both sides of a minor residential street will be superfluous. Sidewalks within a street right-of-way normally should be four-feet wide. Common area paths or walks generally should be wide enough to provide two pedestrian lanes or one pedestrian and one bicycle lane.

(National Assn. of Home Builders, 1982)
**Pedestrian Crossings** — Path and sidewalk street crossings should be located where there is good sight distance along the road. Curb cuts should be provided for users of wheel chairs, wagons, tricycles, and bicycles. Heavily traveled paths at street crossings should have safety devices such as advance warning signs and painted crosswalks. Ideally street crossings should occur at intersections; however, in many planned residential communities mid-intersection pedestrian crossings are common to accommodate pathways.

Heavily traveled roads such as collector and arterial streets should have special treatment for pedestrian crossings. Pedestrian crossing signals and grade-separated crossings such as overpasses and underpasses are normally used to accomplish safe crossings. Underpasses in particular have met with great resistance by residents if they are not properly designed and well lighted. Great care and planning is necessary to determine the appropriate location in order to minimize development costs and to encourage use of these special facilities.

Pedestrian crossing signals should be integrated with vehicular traffic signals to take advantage of stopped vehicular traffic on major streets.

(National Assn. of Home Builders, 1982)
SETBACKS

With today's smaller lots the setback criteria imposed on builder/developers and planners are a major deterrent to good planning. Historically, setbacks for front, side and rear yards were such that if one had an acre lot, there would be ample room to lay out a large house. There was even room to work with the topography and save trees. In addition, the front yards could be varied to produce an interesting streetscape of facades. However, with builder houses on lots one-fifth (1/5) acre or smaller, even the reduction of distances of setbacks can not provide the variety and interest essential in dealing with the higher densities.

Other considerations include outdoor utilization of space. The zero lot-line house is a good example of eliminating one sideyard in order to gain one wider sideyard that is usable as a living space. Reduction of site development costs of driveways and utilities can be achieved by using smaller front yard setbacks.

Energy conservation requires the orientation of houses to respond to controls and devices for solar radiation utilization and wind protection. A certain amount of flexibility in site planning is essential if energy conservation is to be achieved. Rigid setback requirements do not normally provide this flexibility.

Front Yard Setbacks — In one-fifth (1/5) of an acre and smaller lots the maximum front yard setback should be twenty feet in order to accommodate off-street parking. Garages and carports could be closer than twenty feet in order to provide varying front setbacks for a more interesting streetscape. Care should be taken with the design and location of garages and carports to prevent them from becoming the dominant element in the streetscape.

An additional factor in considering front yard setbacks are the types of streets the houses face. Greater setbacks are needed as the traffic volumes increase in order to deal with safety and noise problems. However, if the residential area is planned properly, no single family houses should front on major collector and arterial roads.

(National Assn. of Home Builders, 1982)
Side Yard Setbacks — The zero lot-line concept works the most efficiently and sensibly when dealing with lots that are one-fifth of an acre and smaller. Consideration must be given to fire codes and noise abatement when side yard setbacks are reduced or eliminated. As in the zero lot-line approach, the important factor is total site planning of all the units. Relaxing or eliminating one or both side yard setbacks can not be accomplished without a site coordination plan. As is the case with many subdivision regulations, restrictions are provided in lieu of planning. The less planning required, the tighter the restrictions. The tighter the restrictions, the more rigid the plan.

Rear Yard Setbacks — In most cases, the rear yard setback is not a critical problem. Historically, the rear yard has been designated the prime outdoor living area. The primary variance in this location is due to the side yard emphasis of the patio house with a zero lot-line. Many of these plans combine the rear and one side yard to maximize the usable space for outdoor activities.

Landscaping — As setbacks are reduced or eliminated and lots become smaller, the need for landscaping becomes essential. Street trees of proper size and quantity can do much to unify a street and neighborhood. The tighter dimension between houses and across streets can benefit from the addition of trees and shrubbery to soften and enhance a streetscape.

(National Assn. of Home Builders, 1982)
Mixing Building Types to Increase Solar Efficiency

Legend
- Zero Lot Line
- Duplex

North-South Street
East-West Street

(Jensen, 1986)

Layout and Design for Multifamily Housing (14 du/ac)

Staggered clusters allow direct views and access into open space
Cluster concepts avoid frontage on collector road
Retain drainage swale as a major open space corridor
Collector
Open space link
Zero Lot Line
Single-Family Clusters

138 DU's/16.6 Acres
8.3 DU's/Acre

(Jensen, 1986)

Patterns for Zero Lot Line Development
Zero Lot Line Housing Layout
(16 du/ac)

Design Concepts
This sketch shows a typical layout with units clustered in private courts. The design concepts include:
- Gross density: 8.9 dwelling units per acre
- Lot size: 80 feet by 45 feet
- Lots oriented to maximize open space and privacy
- Setbacks increased along major arterials and collectors to reduce noise problems

(Jensen, 1986)
Land Use Patterns for Zero Lot Line Housing

Project layout orients towards open space

4.9 Dwelling units/acre
Lot size 45' x 70'

Private Parking for Zero Lot Line Housing (Jensen, 1986)
Plant in swale to capture runoff water from adjacent properties—drip irrigate

Street trees

Property line

Quadplex at 8.25 Units per Acre

Triplex at 6.0 Units per Acre (Jensen, 1986)
Emergency "crash gate" provided as part of negotiation process

Additional visitor parking provided to leave streets free for traffic movement

Usable open space

Courtyards create a "sense of place" reducing traffic flow in front of the units

Detention ponds incorporated with existing drainage to provide natural amenity and variety

Street alignment varies creating interesting drive and allowing for buffer zones to screen adjacent land uses

Courtyard signage identifying the space

Existing trees preserved when possible for instant landscape effect

**Design Concepts**
- 8 du/acre
- Limited curb cuts onto collector street
- Clustered courtyards to preserve existing drainage and trees and to create more usable open space

*Clustered Townhouses*

(Jensen, 1986)
Publicly Dedicated Parking for Multifamily Units

(Jensen, 1986)
## Cities with Minimum Street Width Standards Less Than 30 Feet

The following listing of street pavement widths represents a trend toward reducing street standards:

<table>
<thead>
<tr>
<th>State</th>
<th>County</th>
<th>Town or City</th>
<th>Development</th>
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<td>Washington</td>
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*Private lanes are 12 feet wide with occasional widening to 16 feet; these streets are limited to 750 feet and to serving six units.

**Standard local street 37 feet wide.

(Jensen, 1986)