FINAL SITE PLAN AND SPECIAL PERMIT

PLPZ 2020 000297

4 Orchard Street
Set-aside Housing Development – as defined under Section 8-30(g) of Ct. General Statutes

LOCATION:
4 Orchard Street

EXISTING ZONING:
R-7

PARCEL SIZE:
28,180 square feet

STATISTICS

<table>
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<tr>
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<th>EXISTING</th>
<th>PROPOSED</th>
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<tbody>
<tr>
<td>Gross Floor Area:</td>
<td>4,920 sq. ft. commercial</td>
<td>18,053.64 sq. ft.</td>
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<tr>
<td></td>
<td>2,900 sq. ft. residential</td>
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<tr>
<td>Floor Area Ratio:</td>
<td>0.27+/-</td>
<td>0.64</td>
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<tr>
<td>Parking Spaces:</td>
<td>10 approx.</td>
<td>24 standard spaces; 1 ADA space</td>
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<tr>
<td>Number of Residential Units:</td>
<td>1</td>
<td>15 units in 4 buildings; 5 of the 15 units are affordable as defined by State Statute 8-30g.</td>
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<td>Break down of proposed units:</td>
<td>The 15 units will be housed in four (4) separate multi-family buildings. 8 one-bedroom units in Buildings 1 and 2 and 7 three-bedroom units in Building 3 and 4. 5 of the 15 units are affordable, broken down as follows:</td>
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<tr>
<td></td>
<td>Two (2) 3-Bedroom Units for Families Earning Less than 80 Percent of Statewide Median Income, which will include:  o One 3-Bedroom: West Side Unit in Building 3; and  o One 3-Bedroom: Middle Unit in Building 3</td>
<td></td>
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<tr>
<td></td>
<td>Three (3) 1-Bedroom Units for Families Earning Less than 60 Percent of Statewide Median Income, which will include:  o One 1-Bedroom: North Side 2nd floor unit in Building 1  o One 1-Bedroom: North Side 1st floor unit in Building 2; and  o One 1-Bedroom: North Side 2nd floor unit in Building 2</td>
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<tr>
<td>Building Height:</td>
<td>36'</td>
<td></td>
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<tr>
<td>Green area:</td>
<td>Unknown</td>
<td>20%</td>
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<td>Coastal Zone:</td>
<td>The property is in the Greenwich Coastal Overlay Zone and partially (along its southeastern boundary) within the Flood Hazard Overlay Zone (Zones X, Area of Minimal Flood Hazard, and Area of 0.2% Annual Chance of Flood Hazard)</td>
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* For 8-30g applications, the Commission does not make a finding as to compliance with the standards outlined in the Zoning Regulations but rather whether the proposal protects substantial public interests in health, safety or other matters which the Commission may legally consider.
UPDATE:
This application was heard at the January 5th meeting and was left open for the following issues, all of which appear to have been resolved and/or addressed:

1) **Sewer Dept:** As noted in their last comments, the Sewer Division will be conducting a future investigation of the sewer system in the area and the Cos Cob pumping station, but no specific issues have been identified to date. The applicant noted that providing affordable housing is a Town goal and they are fairly certain that an active florist and horticulture business that regularly waters its stock would be a much more sewer intensive use than the 15 residential units we’re proposing.
   a. When staff asked Sewer to clarify the comments and whether the additional information they are looking for should hold up the project or whether they could effectively obtain a permit, the response was: “**The Sewer Division will be able to issue Sewer Permit(s) for the proposed development**”. They do have to submit the necessary applications, drawings, etc. and perform the necessary CCTV inspections, as we have outlined in our comments.

2) **Fire Dept:** The Fire Dept. comments dated January 15, 2021 note that there appears to be some limitations with apparatus movements. Overall, however, he notes that “**the proposed project does not show any obvious life safety concerns and HAS FIRE MARSHAL APPROVAL to proceed through P&Z approval process**”.
   a. In response, the applicant provided a Fire Truck Turning Plan.

3) **Landscape Plans:** The applicant provided updated landscape plans to show (by way of a note) that the fence along the northeastern property line is optional. The applicant is of the understanding that the neighbors are planning on installing a 6-foot high fence approximately 6” into their property. If this fence is installed, the fence on the 4 Orchard property will most likely be eliminated as 2 fences is deemed redundant.

4) **Other:** The applicant provided a narrative addressing the other points raised at the hearing, which are summarized here:
   a. **Did the Board of Education agree to planting?** - The applicant met on site with a member of the BOE on January 12th. The BOE understands that the plantings being offered by the applicant are a gift and that the pending application is not contingent upon the BOE accepting the plantings. The plans will be presented to representatives of the BOE for consideration and the applicant will be informed of the BOE’s decision in the coming months. The applicant is willing to honor the gift as long as it is accepted either before or during the construction period.
   b. **Location of dumpster** – The applicant made changes in and around Building #3 and #4 to improve dumpster location and patio space. See attached narrative and updated landscape plan for details.
   c. **Examine the spacing of the 6 parallel parking spaces in front of Buildings 1 and 2 to try and maximize the available green space** – The applicant is willing to do this during construction when the field conditions can be better assessed.
   d. **Will this project or one similar decrease overall traffic from out of Town individuals?** Applicant notes there is significant data from around the country to suggest that adding affordable housing to infill locations, such as 4 Orchard Street, generally improves jobs-housing match, thereby shortening commutes and reducing Vehicle Miles of Travel.
   e. **Does the applicant have any suggestions on how to make the intersection of Orchard Street/E. Putnam Avenue/Mead Avenue better?**
i. For a comprehensive answer to this question please refer to a letter prepared by Mr. Canning of Kimley-Horn dated January 8, 2021, attached hereto. The applicant summarized the response here: One of the few possible measures that could yield some benefits at the overall Orchard/Putnam/Mead intersection would be the installation of an Adaptive Traffic Control System (ATCS) along the US Route 1 corridor. This type of system would monitor and evaluate traffic volumes in real time and adapt the traffic signal timing to better accommodate the traffic volumes at that particular moment. If the State and Town wanted to pursue an Adaptive Traffic Control System for US Route 1 in this area, Mr. Canning would recommended including the following intersections along US 1, which are all within 1,000 feet of each other (and 1,600 feet total):
  • Cross lane;
  • Taylor Drive;
  • Strickland Road;
  • Sinawoy Road; and
  • Orchard Street

ORIGINAL REPORT:
APPLICATION SUMMARY:
The applicant is requesting final site plan and special permit approval to demolish existing legally non-conforming structures (commercial uses in a residential zone) and constructing a 15-unit multi-family set-aside development pursuant to Connecticut General Statutes Section 8-30g on a 28,180 square foot property in the R-7 zone at 4 Orchard Street. 30% of the proposed 15 rental units, or 5 units, would be restricted affordable housing units. Two of the units would be deed restricted for 40 years to families earning 80% or less of the State median income, and three of the units would be restricted to those earning 60% or less of either the State median income.

The 15 units will be housed in four (4) separate multi-family buildings. 8 one-bedroom units in Buildings 1 and 2 and 7 three-bedroom units in Building 3 and 4.

This proposal would produce a building that is non-conforming with respect to building coverage, allowable floor area, setbacks, green area, density, lighting regulations and parking. However, the Commission is tasked under the State Statutes with not whether this proposal complies with the Zoning Regulations but rather whether or not this proposal will cause substantial public interests in health, safety or other matters of lawful consideration that clearly outweigh the need for affordable housing in Greenwich, or if there are any such public interests, they cannot be protected by reasonable changes to the proposal.

There are several outstanding issues that require additional material and review by Town Departments, primarily dealing with traffic safety, sewers, fire, and how the affordable units are structured. The Commission has received a multitude of comments from the public about this proposal. The clear majority express concern about the density of the development and how that will impact what is described as an already taxed intersection with several conflict points, particularly elementary school children walking to and from school in the morning and afternoons. There is at least one comment that expresses support for the project based on the need for affordable housing.
ISSUES TO BE RESOLVED/RECOMMENDATIONS:
This proposal was seen by the Commission as a pre-application at the December 1, 2020 meeting. The applicant has responded to issues raised at that meeting by submitting additional reports, revised plans, and a point by point narrative, which has been copied below. It is recommended that the application be left open to:

a) Obtain comments from DPW and the BETA Group, the Commission’s traffic consultant, on the revised traffic information. Although there appears to be consensus that the traffic increase is “imperceptible” from the uses that are there now to the proposed, at least when comparing the peaks of those uses based on the ITE Manual, there is the practical matter that the existing uses have not been anywhere close to said peaks and it is anticipated that the 15 units will be. Are there practical solutions that can be used to mitigate this increase and ensure child safety? How can potential back-ups in the intersection with East Putnam Avenue be addressed?

b) Obtain comments from the sewer department in response to materials provided that address existing sanitary sewer flows (with a minimum of two years’ worth of water usage data) and the proposed sewer flows with the necessary reference material used to develop those flows, as well as the appropriate peaking factors, etc.

c) Obtain comments from the Fire Department

d) To get the Housing Unit Equivalency (HUE) points for the market rate units, the affordable units would need to be adjusted such that there are (3) units in the 60% range and (2) units in the 80% range. After this adjustment, the development would meet the definition of a “set-aside”, and therefore all the units would now generate HUE points. The targeting of 60% versus 80% among the unit sizes is not covered in statute or regulation, but case law has simply interpreted the requirement such that the unit mix must be comparable between affordable and market rate. That is, if there are three-bedroom market rate, there must be some three-bedroom affordable units. It has not specified that it must include either 60% or 80%.

Applicant’s 12/18/20 narrative addressing resolution of outstanding issues:

TRAFFIC:
On December 1, 2020 the Planning and Zoning Commission discussed the proposed application with the applicant on a pre-application basis. During this discussion, the Commission asked that the applicant provide a complete traffic study which would include specific information relative to the activities associated with the neighboring Cos Cob School. Specifically, the Commission requested that the applicant’s traffic engineer look at accident data for the full intersection of Route 1 and Orchard Street; analyze how the project may impact the area traffic conditions during both the peak highway and peak school traffic hours; and analyze how the proposed traffic for the project will impact the driveway to Cos Cob School.

A Traffic & Parking Evaluation was prepared by the applicant’s traffic engineer, Kimley-Horn, and submitted as part of the applicant’s original submission to the Commission on October 16, 2020. Using data from the Institute of traffic Engineers (ITE), Kimley-Horn concluded that the net change in traffic activity on the surrounding roadways resulting from the project will be limited to a single additional trip (+1) during the morning peak hour and a
reduction of approximately 3 trips (-3) during the afternoon peak hour, the impact of which will be "imperceptible." The Town’s traffic consultant, BETA Group, Inc. (BETA), provided written comments to the Town on November 12, 2020 and, after review of the provided traffic report did not refute or question Kimley-Horn’s conclusion. In addition, BETA noted that the “amount of parking proposed [25 total spaces] seems reasonable (based on locally available data provided in the Traffic and Parking Evaluation for this site as well as for other recent developments in Greenwich).

The applicant submitted a Traffic and Parking Evaluation dated December 18, 2020. Based on the additional analyses presented in the Evaluation, Kimley-Horn determined that:

• The level of traffic activity at the project driveway will not be increased by the proposed project;

• The adjacent school driveway has 20 times as much traffic as the proposed driveway and has been operating without any changes for the past 15 years;

• The site driveway will be designed and constructed to meet the applicable standards for same;

COMMENTS FROM DPW-ENGINEERING Dated 11/13/2020
In its November 13th comments, the Engineering Division approved the project with respect to its site planning and stormwater management design. Comments that needed to be addressed at this time were from BETA Group, Inc., as noted in the Engineering Division’s first comment:

Comments provided by BETA, followed by the applicant’s response to same are provided below:

• The amount of parking proposed seems reasonable (based on locally available data provided in the Traffic and Parking Evaluation for this site as well as for other recent developments in Greenwich). However, developing a plan to manage the parking spaces on site should be considered (i.e. assigning one or two parking spaces as part of a lease agreement and allowing leaseholders to waive their assignment or potentially purchase an additional space if one is available, or unbundling parking spaces from the lease agreements altogether, etc.). This type of strategy would help ensure adequate parking availability for residents while allowing for the smaller number of spaces to be provided (compared to the typical Town Code requirements).
Response: We believe that the applicant’s proposed parking space allocation plan is consistent with the recommendation made by BETA. The parking management utilized by the applicant through its leasing program will be as follows: Each one-bedroom unit will be provided one permit to display in their vehicle and park in the parking lot. Each townhouse will be provided with 2 permits. Based on the proposed unit make-up a maximum total of 22 permits could be issued for the 24 standard spaces provided (assuming the 8 one-bedroom units all have a need for one space and all 7 townhouses have a need for two spaces). If a tenant does not have a car they will not be provided a permit. If a townhouse tenant only has one car, they will be provided only one permit. Any remaining spaces will either be for
visitors or mail delivery or allocated on a first come first serve basis for one-bedroom units who may have more than one vehicle or a townhouse with another vehicle.

- To encourage the use of active transportation modes for the site (and help reduce parking demand) provide secure and easily accessible bike storage within the development.
  Response: Bike racks have been added to the site plan. Please see the updated plans submitted herewith for specific locations.

- Ensure that there is an accessible route to the entrances of buildings 3 and 4. It appears there is no curb ramp or accessible path between the parking areas and the covered porch areas for these buildings. Additionally, to meet ADA requirements, verify that the travel route along the porch has a minimum width of three feet in areas adjacent to the columns. Also ensure that the landing area for the proposed curb ramp adjacent to the accessible parking space is aligned with the access aisle. Factors developed to reduce parking and trip generation rates that are based on New Jersey data for "people of driving age" in housing in the "lower end of affordability" or "mid-level price range" do not seem appropriate. Are the "lower end of affordability" and "mid-level price range" categories from the New Jersey data comparable to the proposed units for this site? Is the number of people of driving age in a household directly correlated with parking and trip generation rates?
  Response: The plans have been carefully reviewed to ensure that accessible routes are provided to all building entrances as required by applicable regulations. The applicant can confirm that these requirements are met with the proposed site plan.

**ARC COMMENTS ISSUED DEC. 2, 2020**

The Greenwich ARC heard the proposal on 12/2/2020 and approved the proposal. The ARC made the following comments for the applicant's consideration:

a) ARC finds there is an overall lack of landscaping and an overabundance of asphalt. ARC recommends additional areas of landscaping on site, planting of larger trees, planting of trees within parking areas (between spaces) and/or reducing parking spaces for additional green area.
  Response: While we understand the Commission does not concern itself with the finances surrounding a development project, the reality is that most multi-family housing and commercial projects must be economically viable to a developer in order for them to be considered. With respect to any 8-30g application, the State requires that 30% of the units be affordable units. To make this a viable project, at least 15 units are required. Reducing the number of units isn't possible given the price of land, number of affordable units required, and rents that can be collected (for both affordable and market rate units). For this particular site, the developer believes that smaller buildings, which inherently will require more site coverage, better fit in with the neighborhood. The alternative would be fewer, taller buildings, which, in our view, would not be as compatible with the surrounding neighborhood.
In addition to the above, the number of on-site parking spaces provided herewith meet the market demands for parking. Providing adequate parking is more essential to the viability of this project than providing additional greenspace. All of the above said, the applicant has added additional groundcover plantings between the proposed parking spaces and buildings to increase the site’s greenspace to the greatest possible extent while still maintaining the 25 proposed parking spaces. Please see the updated Landscape Plan dated December 15, 2020 provided herewith for more details.

b) ARC does not find it reasonable that trees proposed on the neighboring Cos Cob school property are counted as landscaping/screening for this project.
Response: The applicant is not “counting” the landscaping proposed for the Cos Cob School property as part of its site landscaping. However, this approach was used for similar projects at 176 Hamilton Avenue, which abuts Hamilton Avenue School, and 303 Hamilton Avenue in order to provide additional screening on abutting residential property. The applicant has offered to incur the expense of additional landscaping to enhance the area and provide additional screening between the school use and the proposed residential use. If the Commission and/or the Board of Education is not interested in this donation then the applicant will not move forward with same. A note has been added to the plan that a fence will be installed along the property boundary at the owner’s discretion and will be installed if the offsite plantings are not approved.

c) The applicant indicated that the concrete pad in front of the existing building will be reduced and a grass strip added, but the landscaping plan should accurately reflect this upgrade.
Response: Please refer to the updated plans provided herewith, which have incorporated comments from the Engineering Division that recommended the installation of granite curb along the entire property frontage, the installation of a minimum 5-foot concrete ADA compliant sidewalk along the entire property frontage, and the installation of a minimum 3-foot grass strip along the entire property frontage. This ROW design will be consistent with the neighborhood and decrease the overall amount of impervious coverage that currently exists with the ROW adjacent to the subject site.

d) Consider relocating condenser units to the roof in order to find space for more green area.
Response: This suggestion cannot be accommodated due to the associated cost and current building design. To relocate the condensing units to the roof, the buildings would need to have roof access, railings and flat roofs, at least in part, all which would substantially increase costs and change the character of the proposed buildings.

e) Change the color of the roof from charcoal to a softer color such as weathered wood.
Response: The applicant is agreeable to this suggestion and will use the softer shingle color Pewter Gray.

f) Address the proportion of the windows on Building 1, facing the street, as they look too “squat” on the drawings. “2 over 1” windows are acceptable to ARC. The applicant agreed to submit window cut sheets to confirm the proper size.
Response: It is not clear if the windows that the ARC commented on were actually the windows facing the street. We believe that the “squat windows” referred to were those on the front (south) façade of Buildings 1 & 2, which face the driveway. Those windows have been modified and the updated elevations for Buildings 1 and 2 are submitted herewith.

g) Clearly show all dumpster locations and screening on plans, and address any adverse impacts on the outdoor patios that will be close to the refuse.
Response: The refuse and recycling areas are clearly shown on the plans and are located in-between Buildings 1 and 2, as well as behind Building #3. The plans also clearly show proposed rubbish enclosures that include fencing and gates surrounding said areas.

COMMENTS FROM SEWER DIVISION Dated DECEMBER 9, 2020
The Greenwich Sewer Division issued the following comment on December 9, 2020 to be addressed during the P&Z process:
The proposed project is tributary to an area that is influenced by severe storm events from potential Inflow & Infiltration sources. Due to these concerns, the Sewer Division requires that the applicant/owner please submit both the existing sanitary sewer flows (with a minimum of two years-worth of water usage data) and the proposed sewer flows with the necessary reference material used to develop those flows, as well as the appropriate peaking factors, etc. Please have the applicant/owner provide/submit to the Sewer Division for review.
Response: Submitted herewith is a Report Regarding Water Consumption for 4 Orchard Street dated September 1, 2020 prepared Musco Engineering Associates. We have also included the water consumption history from 2012 through 2020 as provided by Aquarion Water Company. This information was sent directly to Mr. Feminella earlier this week.

QUESTIONS REGARDING AFFORDABILITY PLAN:
When Mike Santoro, Department of Housing, was asked: Can you please confirm none of the three-bedroom units would have to be offered at 60%? Would these units count for HUE points as the 30% is 5 units and cannot be split equally for the 15% (60%) and 15% (80%)? – His response is as follows:

1. The statute and regulation require “not less than 15%” serve the 60% income limit, so it would have to be (3) units in the 60% range and (2) units in the 80% range to qualify as a “set-aside” development. If the proposed project does not need to avail itself of the appeal under 8-30g CGS, then you, the Town, can accept any mix that you find acceptable under your planning/zoning requirements.
2. Regardless, the only relevance for HUE’s is getting credit for the non-affordable units (0.25 points per market rate unit in a set-aside development). To get the credit for the market rate units, the mix would have to meet the definition of a set-aside development as noted above.
3. With regard to the targeting of 60% versus 80% among the unit sizes, this is NOT covered in statute or regulation, but case law has simply interpreted the requirement such that the unit mix must be comparable between affordable and market rate. That is, if there are three-bedroom market rate, there must be some three-bedroom affordable units. It has not specified that it must include either 60% or 80%......you, the Town, can make that call, if you want, with the understanding that if the developer does not like agree with your
position, he would have the right to bring an appeal to Superior Court.

OTHER:
1) A turning radius for truck traffic (Fire Apparatus, UPS trucks, garbage trucks) entering the property should be shown.
2) The proposed signage for the property should be submitted.
3) Parking space #1 is a parallel parking space. Is there a conflict being so close to the road and the sidewalk? Is there enough room for a car to pass should they be entering in to the property when someone is trying to park in that space?

APPLICATION DETAILS:
FLOOR AREA:
The total floor area is proposed as 18,053.6 square feet where the current zoning permits 10,144.8 square feet, as a matter of reference.

Proposed Building 1 - is a 3-story, 3,511.4 SF (2,802.04 SF habitable) building located on the southeasterly side of the site, adjacent to Orchard Street. This building will contain four (4) one-bedroom units, providing 2 units on each of the first and second floors. The third floor is larger than 40% of the second floor, but is comprised of non-habitable, trussed area. The building will not have a basement and will be built on a crawl space, which is not required to be included in the floor area calculations for this site.

Proposed Building 2 - is located to the west of Building #1 and will be identical to Building #1 in terms of its footprint and superstructure.

Proposed Building 3 - is a 3-story, 4,713.2 SF building with three (3) 3-bedroom, three and a half bath townhouse units. Each unit will include an unfinished basement space (option to finish basement by Owner);

Proposed Building 4 - is located on the far northwestern side of this site, and is similar to Building #3 but will contain four (4) 3-bedroom, three and a half bath townhouse units. Building #4 is also three stories but contains 6,317.6 SF of gross floor area.

All of the buildings will include covered porches and have access to outdoor patio areas. The applicant notes that all first floor one-bedroom units will be built as "Accessible Type B Dwelling Units" as required by the building code. A "Type B unit" in the building code essentially conforms to the Fair Housing Act (FHA) guidelines for accessible units and are often referred to as ‘adaptable’ units because they have features that are considered easily modified to accommodate a wide range of possible tenant accessibility needs. While the buildings do not have elevators, all of the second floor one-bedroom units will also be built as Type B units, which the applicant further notes exceeds the building code requirements for the proposed development.

PARKING
The applicant is proposing twenty-five (25) parking spaces, including one (1) handicap space. The existing driveway/curb cut will be closed, and a new driveway and curb-cut will be created in
relatively the same location but sized according to Highway Department Standards. Access will remain from Orchard Street.

Kimley-Horn has projected that the fifteen (15) new apartments will generate no more than 21 parked vehicles at any time, which can be accommodated in the 24 standard spaces and 1 ADA/handicapped parking space proposed.

The site is close to the bus stops on East Putnam Avenue for the #311 and 311B buses, which provide 16 buses per direction per day connecting downtown Stamford, Greenwich and Port Chester.

REGULATORY AUTHORITY - 8-30(g)
The Affordable Housing Land Use Appeals Procedure requires municipalities with less than 10% affordable housing to demonstrate to the court that a municipality’s rejection of a development proposal is supported by sufficient evidence in the record. Municipalities also have the burden to prove, based upon the evidence in the record compiled before them, that: (a) the decision was necessary to protect substantial public interests in health, safety, or other matters the municipality may legally consider; (b) the public interests clearly outweigh the need for affordable housing; and (c) public interests cannot be protected by reasonable changes to the affordable housing development; or the application which was the subject of the decision from which the appeal was taken, would locate affordable housing in an area which is not assisted housing, as defined in C.G.S. Section 8-30g. If the municipality does not satisfy its burden under C.G.S. Section 8-30g, the court will wholly or partly revise, modify, remand or reverse the decision from which the appeal was taken in a manner consistent with the evidence in the record before it.

According to the Department of Housing Affordable Housing 2019 Appeals List, the Town has 5.32% of their housing units as affordable and is therefore not an exempt community.

The applicant has provided an Affordability Plan. The referenced income to be used is the State Median Income, which is appropriate since that is less than the Area Median Income. It is correctly that an annual report is due to document that the units are being administered in keeping with the Statutes. The Planning and Department has a system to verify this report that is administered annually.

Existing conditions:
The property is served by public utilities and is currently improved with a 2,000+/- SF retail store, d/b/a Greenwich Florist, with attached greenhouse; a 2,500+/- SF commercial greenhouse; a 420+/- SF detached garage; and a 2,900+/- single-family dwelling. The site is accessed by a single driveway that intersects with Orchard Street. As surface parking area is present which is partially paved but not striped and currently used for parking by the property’s occupants as well as visitors to the florist shop. According to the Tax Field Card for the property, the surface parking area can accommodate ten (10) vehicles. There currently exist a number of legal non-conformities which include: use, and deficient front, side, and rear yard setbacks.
From: Natale, Robert  
Sent: Friday, January 15, 2021 9:53 AM  
To: DeLuca, Katie <Katie.DeLuca@greenwichct.org>  
Subject: #4 ORCHARD ST

Katie,
Below are the Fire Marshal Comments for #4 Orchard St.

The proposed project is located at #4 Orchard St. The project description is 15 unit, multi-family occupancies spread out over 4 structures. This developer has presented similar property development projects in Greenwich, all of which have been approved and constructed. This project follows a similar design layout as those presented before. This layout does appear to limit getting fire apparatus in the property and placed at each building strategically, in the event of an emergency incident. The analysis of the traffic study that was provided by the applicants traffic engineer states “there is adequate access for emergency vehicles”. A review by the Greenwich Fire Marshal Office finds that fire apparatus can enter the proposed property from the public street, however getting apparatus positioned at or around all buildings does appear to be limited. This is most apparent between building #3 and #4. The aerial ladder truck would be restricted for optimal placement at this location.

The placement of the structures as they relate to the property line does also appear to be a concern when 360 degree access around the building would be optimal during an incident where firefighting hose lines or ground ladders are being used. The proposed, optional trees located on the west side of the property, between the subject property and Cos Cob school would be an obstruction to fire apparatus accessing the property if the tree canopy is too large when mature.

The structures themselves appear to be pre-fabricated, modular stacked construction. The layout and design does not appear to be out of the ordinary nor does it present with any obvious fire safety code concerns.

Overall, the proposed project does not show any obvious life safety concerns and HAS FIRE MARSHAL APPROVAL to proceed through P&Z approval process.

NOTE: This is NOT an official plan review for a building permit. The Fire Marshal plan review will be conducted when a building permit application is received.

Rob Natale  
Deputy Fire Marshal  
Greenwich Fire Department  
15 Havemeyer Place  
Greenwich, CT 06830  
(203) 622-3957
January 22, 2021

Mr. Robert Natale  
Deputy Fire Marshall  
Greenwich Fire Department  
15 Havemeyer Place  
Greenwich, CT 06830

Re: Fire Truck Access  
4 Orchard Street  
Town of Greenwich, Connecticut

Dear Deputy Natale:

Kimley-Horn and Associates, Inc. has conducted an assessment of fire access to the proposed new development located at 4 Orchard Street in the Town of Greenwich. The subject property is currently developed with a single-family residence and a florist/horticultural business. The applicant proposes to demolish the existing residence and commercial buildings and construct four (4) multi-family residences containing a total of 15 dwelling units.

The subject property is shown on the attached aerial photo which also indicates the locations of the nearest hydrants. To ensure that the proposed site follows all of the protocols as listed by the 2015 CT State Fire Access Code, Kimley-Horn has prepared the attached plans that show the proposed fire access road (relative to the buildings and their access points) and fire apparatus turning movement diagrams for each of the Greenwich Fire Department trucks. The plans provided are listed below.

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<tr>
<th>Plan No.</th>
<th>Plan Description</th>
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<tbody>
<tr>
<td>FA-1</td>
<td>Shows the 20-foot wide fire access road</td>
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<tr>
<td>FA-2</td>
<td>Shows front doors of each unit within 50 feet of the fire access road</td>
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<tr>
<td>FA-3</td>
<td>Shows all portions of the outside of all buildings are within 150 feet of the fire access road</td>
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<thead>
<tr>
<th>Fire Apparatus Turning Diagrams</th>
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<tbody>
<tr>
<td>FT-1 Turning Maneuvers for Engines #1, 3 &amp; 5 <em>(1)</em></td>
</tr>
<tr>
<td>FT-2 Turning Maneuvers for Seagrave Marauder II</td>
</tr>
<tr>
<td>FT-3 Turning Maneuvers for Seagrave Marauder II (coming from North Street Station 8)</td>
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<tr>
<td>FT-4 Turning Maneuvers for Arrow XT</td>
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</table>

*(1): Engine #3 is not shown on the plans as it is smaller than Engines #1 & 5.*

As shown on the Plans, the site complies with all sections of the 2015 Connecticut State Fire Code, having access to all units within 50 feet of the Fire Access Road and having no distance around the exterior of the buildings being longer than 150 feet away from the Fire Access Road. Nearly all the
Fire Trucks used by the Greenwich Fire Department can fully navigate the Fire Access Road. The exception, the Greenwich Arrow XT will have to back out onto Orchard Street to exit.

Please contact me at the address below if you have any questions.

Very truly yours,

KIMLEY-HORN AND ASSOCIATES, INC.

John Canning, P.E.
Project Manager
Connecticut P.E. No. 0028017
Site Location
4 Orchard St.
FIRE ACCESS DISTANCE AROUND UNITS

FA-3

4 Orchard Street
Greenwich, CT 06807

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This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for use by the Town of Greenwich, Connecticut, for the development of the Orchard Street Area. Any reproduction or adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.
Hi Katie,

Thanks for your message.

Yes, of course you can.

All the best,
Rich

---

That is really helpful. This is an 8030g application so I just want the Commission to know whether or not there is a public health and safety issue that rises to a significant enough level that warrants denial etc. Can I enter your e-mail into the record?

---

The Sewer Division will be able to issue Sewer Permit(s) for the proposed development. They do have to submit the necessary applications, drawings, etc. and perform the necessary CCTV inspections, as we have outlined in our comments.

In relation to flows, while the current active florist may consume a lot of water, most of that water is going into plants, etc. not into the sewer system. The proposed development however, will be increasing their discharge to sanitary sewer.

If you have any questions, please let me know.

Thank you,

Rich
If the Commission approved 4 Orchard Street, would they be able to get a sewer permit?

Thanks

From: Michele Cronin <mcronin@fcsn.com>
Sent: Wednesday, January 20, 2021 2:15 PM
To: DeLuca, Katie <Katie.DeLuca@greenwichct.org>
Cc: Bruce F. Cohen <BCohen@fcsn.com>; 'Joseph A. Pecora' <jpecora@pecorabrothers.com>
Subject: RE: 4 Orchard Place review

[EXTERNAL]
Hi Katie,

I wasn’t planning on submitting a formal response to these comments.

What I got out of the comments was that the Sewer Division will be conducting a future investigation of the sewer system in the area and the Cos Cob pumping station, but no specific issues have been identified to date.
In my view, providing affordable housing is a Town goal and I am fairly certain that an active florist and horticulture business that regularly waters it’s stock would be a much more sewer intensive use than the 15 residential units we’re proposing.

Is there something specific you’re looking for in response to the comments?

Thanks,
Michele

Michele A. Cronin, AICP
Land Use Analyst

Fogarty Cohen Russo & Nemiroff LLC
1700 East Putnam Avenue
Suite 406
Old Greenwich, CT 06870
T. 203.629.7336 | M. 203.970.8182
E. mcronin@fcsn.com
We have prepared the following comments and questions regarding the proposed application.

Project Summary:
- 15-Unit Multi-Family Set Aside Development Pursuant to C.G.S Section 8-30g.

Sewer Division Comments:
Comments to be addressed during P&Z phase:
- The proposed project is tributary to an area that is influenced by severe storm events from potential Inflow & Infiltration sources. Due to these concerns, the Sewer Division requires that the applicant/owner please submit both the existing sanitary sewer flows (with a minimum of two years-worth of water usage data) and the proposed sewer flows with the necessary reference material used to develop those flows, as well as the appropriate peaking factors, etc. Please have the applicant/owner provide/submit to the Sewer Division for review.

Comments to be addressed during Sewer and Building Permit phase:
- The applicant/owner will be required to obtain the necessary Sewer Permits. Please coordinate directly with the Sewer Division.

- In order to determine how and where the proposed sewer lateral(s) should be made as a result of this project, the applicant/owner is required to obtain a Sewer CCTV Inspection Permit and have the two existing sewer laterals CCTV inspected with the Environmental Asset Engineer present, the CCTV inspection recorded on a DVD and submitted to the Sewer Division for review. This will be used to determine how and where the sewer connection shall be made to the sewer main.

- Please have the applicant/owner’s engineer coordinate directly with the Sewer Division. The proposed sewer lateral may require connection to one or both of the existing sewer lateral stubs on the sewer main. The Sewer Division does not want any additional new penetrations in the Town’s sewer main, unless it is determined that there is no way possible to re-use the existing two lateral connections for this property. Please coordinate directly with the Sewer Division for details.

- Please note, sanitary sewers are designed for first floor elevations. Therefore, any plumbing fixtures in lower levels (basements) could be subject to sanitary sewer backups/overflows. The property owner is strongly recommended to consider and review this and plan accordingly to protect themselves in those situations. The Town is not
responsible for damages as a result of these connections/installations. Please consider this and revise accordingly.

- Please note, in accordance with Town regulations and standard practice, all clear water sources cannot discharge to sanitary sewer. This includes air conditioning and high efficiency heating system condensate lines. Please confirm that the new development will not discharge any clear water sources to sanitary sewer.

Please NOTE: These comments are intended for P&Z review only. These comments do not take the place of Sewer Permit(s). Any Sewer Permit Applications receive thorough reviews and may result in additional comments/requirements at that time. In addition, please be reminded that in order to receive Building Permits, the applicant must have secured all other necessary permits, including, but not limited to, Sewer Permits PRIOR to obtaining their Building Permits.

Also, please note, the applicant should NOT submit for Sewer Permits until the project has received approval from P&Z.
BY EMAIL & MAIL

January 20, 2021

Planning and Zoning Commission
Town Of Greenwich
101 Field Point Road
Greenwich, CT 06830

RE: Final Site Plan and Special Permit #PLPZ 2020 00297
Affordable Housing Development Application Pursuant to CGS Section 8-30g Including:
Application for Final Site Plan/Special Permit Approval for a 15 Unit "Set-aside development"
4 Orchard Street, Greenwich; R-7 Zone
Applicant: 4 Orchard LLC

Dear Members of the Planning and Zoning Commission:

The above-referenced project was discussed with the Commission at its January 5, 2021 public hearing. This letter is a response to the various questions raised at that hearing, with a restatement of the comments from the Commission provided below followed by our response to same.

P&Z COMMISSION COMMENTS FROM 01/05/2021 PRE-APPLICATION MEETING

1) The applicant was asked to clarify if the Board of Education (BOE) had agreed to the proposed plantings on Town Property.

Response: The applicant met on site with a member of the BOE on January 12th to review the proposed plantings on the BOE property. The BOE understands that the plantings being offered by the applicant are a gift and that the pending application is not contingent upon the BOE accepting the plantings. Unfortunately, the BOE will not be able to consider and act upon the plantings being offered by the applicant by February. The plans will be presented to representatives of the BOE for consideration and the applicant will be informed of the BOE’s decision in the coming months. The applicant is willing to honor the gift as long as it is accepted either before or during the construction period.

Again, the BOE decision to accept the offered plantings should not hold up the Planning and Zoning Commission’s ability to make a decision on this pending set-aside development project. For clarification purposes, we are submitting herewith a version of the landscape plan with the proposed plantings on the BOE property and another version of the landscape plan showing only plantings on the subject site.

2) The applicant was asked to look at the location of the dumpsters.

Response: We appreciate this comment made by Mr. Macri and have made the following adjustments to the site plan with respect to this item:

- The refuse area previously shown on the west side of Building #3 was a shared refuse space for Buildings #3 and #4. This refuse area, and the bike rack at the northeast corner of Building #3, have been removed and replaced with landscaping.
- A refuse area for Building #3 has been added to the east of this building (#3) and screening has been provided along the rear and sides of the refuse containers.
• The common patio of Building #3 has been relocated from the Southeast portion of Building #3 to the Northeast portion of Building #3.

• A refuse area for Building #4 has been added to the west side of Building #4 and screening has been provided along the rear and sides of the refuse containers.

• The bike rack noted above has been relocated to the east of Building #4.

An updated Landscape Plan has been submitted herewith to reflect the minor site plan changes noted above.

3) The applicant was asked to examine the spacing of the 6 parallel parking spaces in front of Buildings 1 and 2 to try and maximize the available green space.

Response: The applicant is open to this suggestion and has agreed to look at the field conditions during the construction process to determine if reducing the width of the hatched area between spaces #6 and #7 (by approximately 1-2 feet) is feasible or desirable. If the applicant is comfortable in safely shifting the spaces as noted above, that will be done and the landscaped area to the south of the parallel spaces can be increased by a proportionate amount.

4) While not specific to this project, the Commission was interested to understand if this development, or a development like this one, would decrease overall traffic from out of Town individuals.

Response: For a comprehensive answer to this question please refer to a letter prepared by Mr. Canning of Kimley-Horn dated January 8, 2021, attached hereto.

In short, there is significant data from around the country to suggest that adding affordable housing to infill locations, such as 4 Orchard Street, generally improves jobs-housing match, thereby shortening commutes and reducing Vehicle Miles of Travel. Since the cost to live at 4 Orchard Street will likely fall at the lower end of housing costs in Cos Cob, residents will likely make shorter trips than residents of other types of housing in the area. It is also worth noting that the applicant has tiered application process that gives priority to tenants who are elderly/disabled/veterans and teachers/Town Employees, which will likely result in intra-Town travel.

5) While not specific to this project, the Commission asked the project traffic engineer if he could provide suggestions on how to make the overall Orchard Street/E. Putnam Avenue/Mead Avenue intersection better.

Response: For a comprehensive answer to this question please refer to a letter prepared by Mr. Canning of Kimley-Horn dated January 8, 2021, attached hereto.

In short, one of the few possible measures that could yield some benefits at the overall Orchard/Putnam/Mead intersection would be the installation of an Adaptive Traffic Control System (ATCS) along the US Route 1 corridor. This type of system would monitor and evaluate traffic volumes in real time and adapt the traffic signal timing to better accommodate the traffic volumes at that particular moment. If the State and Town wanted to pursue an Adaptive Traffic Control System for US Route 1 in this area, Mr. Canning would recommended including the following intersections along US 1, which are all within 1,000 feet of each other (and 1,600 feet total):
FOGARTY COHEN RUSSO & NEMIROFF LLC

Re: PLPZ 2020 00297 (Pending)
January 20, 2021
Page 3 of 3

• Cross lane;
• Taylor Drive;
• Strickland Road;
• Sinawoy Road; and
• Orchard Street

In addition to the above, we know that the Commission was also waiting on comments to be issued from the Fire Marshal and the Sewer Division. Comments were issued on January 15th and January 12th, respectively, and we do not believe further comments from our office are required.

We look forward to discussing this application further with the Commission at its February 2, 2021 public hearing. Should you or staff have any questions or comments in the interim, please do not hesitate to contact me at 629-7330.

Very truly yours,

Bruce F. Cohen

Enclosures

cc (w/encl.): 4 Orchard LLC
Rocco V. D’Andrea, Inc.
Edgewater Group Architects
Environmental Land Solutions, LLC
Kimley-Horn and Associates, Inc.
January 8, 2021

Mr. Joseph Pecora
Pecora Brothers, Inc.
70 Hamilton Avenue
Greenwich, CT 06830

Re: Likely Travel Times of Lower Income Residents
   Potential Improvements to the intersection of Orchard Street with US Route 1
   4 Orchard Street
   Town of Greenwich, Connecticut

Dear Mr. Pecora:

A question raised by Planning and Zoning Commissioner Hardman relative to the above project was whether residents of projects similar to that proposed typically have longer or shorter trips than residents of larger and, presumably, more affluent residences. Research of this question reveals that the relationship between income and trip length tends to be a location-specific phenomenon and depends on how you define lower income as well as the presence of viable transportation choices, and the availability of retail and public services.

Many major metropolitan areas have experienced significant increases in the cost of housing. For that reason, many major cities, such as New York, find its wealthiest residents living in closer proximity to their place of employment. Based on this locality, in these situations it is the higher income households that experience the shortest commute times. These expensive urban centers shift/push lower income residents to the outskirts of the city’s limits to find more affordable housing, resulting in longer commutes to and from their places of employment.

Greenwich, however, does not quite fit this mold. It is an affluent suburban community that has a Central Business District and older, somewhat self-contained, higher density villages that allow for some lower-income accommodations where the residents may serve the local community rather than commute to jobs in New York City.

Attached are several sources of information that provide support for both cases (i.e. lower income residents have shorter trips and lower-income residents have longer trips).

Probably the most relevant testimony, though evidentiary substantiation was not readily available, was a statement from the Governor of California’s Office of Research that stated that “adding affordable housing to infill locations (such as 4 Orchard Street) generally improves jobs-housing match, thereby shortening commutes and reducing VMT” (Vehicle Miles of Travel). The testimony also states that “low-income housing … generates less VMT than market-rate housing”.

Data published by the Bureau of Transportation Statistics in 2007 indicates that lower-income households have both fewer and shorter trips than higher-income households.

2018 data from the California Department of Transportation also indicates that lower-income households make fewer vehicle trips (and have lower vehicle ownership), that residents of suburban neighborhoods make slightly fewer trips per person but more trips by vehicle than more urban neighborhood types. The data also indicates proportionately fewer vehicle miles of travel as income drops (as compared to the value for a household of 4 in an above-moderate-income suburban setting).
A 2020 study of mobility in and around Charlotte North Carolina revealed that in certain pockets of the Charlotte area those with the highest income have the longest commutes, while those with the lowest income have the shortest commute. That said, there are at least two lower income neighborhoods that have some of the longest commute times, while there is a large area near the downtown where residents with the highest income have the shortest commutes (which is likely a function of the fact that these residents have the income to afford the short commute by choice). The Charlotte data also shows that areas where the average annual income is less than $50,500 predominantly have shorter commute times (in most of these neighborhoods, though not all, approximately half of residents have commute times of less than 20 minutes).

Finally, information from the Memphis metropolitan area in 2015 also indicates that households earning less than $25,000 per year generally have the shortest travel times.

In short, while there is no locally definitive evidence, there is significant data from around the country to suggest that the residents of 4 Orchard Street, the cost of which to live in will likely fall at the lower end of housing costs in Cos Cob, will make shorter trips than other types of housing in the area.

A question raised by Planning and Zoning Commissioner Yesky at the January 5th Planning and Zoning Commission meeting was, though not necessarily tied to the project, what improvement could be made to the congested intersection of US Route 1 with Orchard Street and Meade Street?

Given the likely real estate limitations, one of the few possible measures that could yield some benefits would be the installation of an Adaptive Traffic Control System (ATCS) along the US Route 1 corridor. An Adaptive Traffic Control System is a system of software, micro-processors and vehicle detectors which monitors and evaluates traffic volumes in real time and adapts or modifies traffic signal timing, including offsets controlling the progression of traffic from signal to signal, to better accommodate the traffic volumes at that particular moment.

By receiving and processing data from sensors to optimize and update signal timing settings, adaptive signal control technologies can determine when and how long lights should be green. It also decides what the best relative release time is for vehicles travelling from signal to signal along the corridor so that they can arrived at the next signal as it turns green. Adaptive signal control technologies help improve the quality of service that travelers experience (see attached brochure).

If the State and Town wanted to pursue an Adaptive Traffic Control System for US Route 1 in this area, it should probably include the following intersections along US 1, which are all within 1,000 feet of each other (and 1,600 feet total):

- Cross lane;
- Taylor Drive;
- Strickland Road;
- Sinawoy Road; and
- Orchard Street

Please contact me at the address below if you have any question.
Very truly yours,
KIMLEY-HORN AND ASSOCIATES, INC.

John Canning, P.E.
Project Manager
Connecticut P.E. No. 0028017
Table 1 indicates significantly lower vehicle ownership with lower income. Table 2 shows not only shorter average trip with lower income but also fewer trips with lower income.
Table 12 shows lower number of trips and lower vehicle ownership with lower income.

<table>
<thead>
<tr>
<th>Table 12 Models of vehicle ownership, home-based motorized vehicle trips, and person trips</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Home-based Vehicle Trips</strong></td>
</tr>
<tr>
<td>--------------------------------</td>
</tr>
<tr>
<td><strong>Housing Type</strong></td>
</tr>
<tr>
<td>Multifamily</td>
</tr>
<tr>
<td><strong>Income</strong></td>
</tr>
<tr>
<td>Extremely Low-Income</td>
</tr>
<tr>
<td>Very Low-Income</td>
</tr>
<tr>
<td>Low-Income</td>
</tr>
<tr>
<td>Median/Moderate Income</td>
</tr>
<tr>
<td>Above Moderate Income</td>
</tr>
<tr>
<td><strong>Place Type</strong></td>
</tr>
<tr>
<td>Non-Urban</td>
</tr>
<tr>
<td>Suburban Neighborhood</td>
</tr>
<tr>
<td>Urban Neighborhood</td>
</tr>
<tr>
<td>Urban District</td>
</tr>
<tr>
<td>Urban Core</td>
</tr>
<tr>
<td><strong>HH Size</strong></td>
</tr>
<tr>
<td><strong>HH Size Squared</strong></td>
</tr>
<tr>
<td><strong>Weekend Day (Fri-Sun)</strong></td>
</tr>
</tbody>
</table>
Presumption of Less Than Significant Impact for Affordable Residential Development

Adding affordable housing to infill locations generally improves jobs-housing match, in turn shortening commutes and reducing VMT.\textsuperscript{24,25} Further, ... low-wage workers in particular would be more likely to choose a residential location close to their workplace, if one is available."\textsuperscript{26} In areas where existing jobs-housing match is closer to optimal, low income housing nevertheless generates less VMT than market-

\textsuperscript{21} Pub. Resources Code, § 21155 ("For purposes of this section, a high-quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.").

\textsuperscript{22} Including naturally-occurring affordable residential units.


\textsuperscript{24} Karner and Benner (2016) The convergence of social equity and environmental sustainability: Jobs-housing fit and commute distance ("[P]olicies that advance a more equitable distribution of jobs and housing by linking the affordability of locally available housing with local wage levels are likely to be associated with reduced commuting distances").

\textsuperscript{25} Karner and Benner (2015) Low-wage jobs-housing fit: identifying locations of affordable housing shortages.

\textsuperscript{26} Karner and Benner (2015) Low-wage jobs-housing fit: identifying locations of affordable housing shortages.

Therefore, a project consisting of a high percentage of affordable housing may be a basis for the lead agency to find a less-than-significant impact on VMT. Evidence supports a presumption of less than significant impact for a 100 percent affordable residential development (or the residential component of a mixed-use development) in infill locations. Lead agencies may develop their own presumption of less than significant impact for residential projects (or residential portions of mixed use projects) containing a particular amount of affordable housing, based on local circumstances and evidence. Furthermore, a project which includes any affordable residential units may factor the effect of the affordability on VMT into the assessment of VMT generated by those units.
Figure 11 shows residents of suburban neighborhoods make slightly fewer trips per person than the 3 other neighborhood types but Figure 10 shows increasing number of vehicle-based trips as development density decreases from urban to suburban.
Table 13 shows proportionately fewer vehicle miles of travel for all locations as income drops (as compared to 100% value for a household of 4 in an above moderate income suburban setting)

<table>
<thead>
<tr>
<th>Place Type:</th>
<th>Vehicle Miles Traveled:</th>
<th>Percent of Base Case Scenario*:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-Urban</td>
<td>Suburban Neighborhood</td>
</tr>
<tr>
<td><strong>Vehicle Miles Traveled:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single-Family Housing Unit</td>
<td></td>
<td>Percent of Base Case Scenario*:</td>
</tr>
<tr>
<td>Household Income Category</td>
<td>Non-Urban</td>
<td>Suburban Neighborhood</td>
</tr>
<tr>
<td>Extremely Low Income</td>
<td>6%</td>
<td>5%</td>
</tr>
<tr>
<td>Very Low Income</td>
<td>4%</td>
<td>15%</td>
</tr>
<tr>
<td>Low Income</td>
<td>31%</td>
<td>39%</td>
</tr>
<tr>
<td><strong>Median/Moderate Income</strong></td>
<td>68%</td>
<td>63%</td>
</tr>
<tr>
<td><strong>Above Moderate Income</strong></td>
<td>80%</td>
<td>(45 mi)</td>
</tr>
<tr>
<td><strong>Vehicle Miles Traveled:</strong></td>
<td>Multifamily Housing Unit</td>
<td>Percent of Base Case Scenario*:</td>
</tr>
<tr>
<td>Household Income Category</td>
<td>Non-Urban</td>
<td>Suburban Neighborhood</td>
</tr>
<tr>
<td>Extremely Low Income</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Very Low Income</td>
<td>2%</td>
<td>8%</td>
</tr>
<tr>
<td>Low Income</td>
<td>16%</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Median/Moderate Income</strong></td>
<td>35%</td>
<td>33%</td>
</tr>
<tr>
<td><strong>Above Moderate Income</strong></td>
<td>41%</td>
<td>51%</td>
</tr>
</tbody>
</table>

NOTE: * Base case scenario is a four-person household earning an above moderate income and living in a single-family housing unit located within a suburban neighborhood (denoted in this table with a box).
CAR TRAVEL

Commuter Times
The map to the right shows the percentage of commuters who live within Charlotte and travel 20 minutes or more to work. In 2018, the mean travel time to work was about 25 minutes for Charlotte residents. Commute times are generally shorter in places that have access to transit and walking/biking options to get to Uptown-like areas along the LYNX Blue Line. This includes the LYNX Blue Line Corridor along South Boulevard as well as the Dilworth and Metropolitan areas that have better biking/walking options and the City of Charlotte LYNX Gold Line Streetcar.

24.6 Average Daily Commute Time (Minutes)
36.8% Commute More than 30 Minutes Daily
22% Average Household Income Spent on Transportation (HTA Index)
$15,719 Average Annual Household Cost of Driving in Charlotte (City of Charlotte)

RACIAL AND ECONOMIC PATTERNS

Income
The median household income for the City is around $61,000. Average household incomes in Uptown and SouthPark are around $100,000. The average income within the Arc (introduced on the adjacent page) is approximately $49,705.

Considering the median household income is crucial to understand the associated transportation and opportunity burdens a community—or subset of a community—faces. Access to transportation is one of the highest indicators of job accessibility and economic mobility. A component of the Arc map, income clearly follows the spatial boundary of economic segregation in Charlotte.

Exhibits indicate that, certainly, in certain pockets of the Charlotte area, those with the highest income have the longest commutes, while those with the lowest income have the shortest commute. That said, there are at least two lower income neighborhoods that have some of the longest commute times, while there is a large area near to the downtown where residents with the highest income have the shortest commutes.

Charlotte’s highest income areas are heavily concentrated in areas south of Uptown.

$61,993 Median Household Income (US Median: $61,937)
CAR TRAVEL

Commute Times

The map to the right shows the percentage of commuters who live within Charlotte and travel 20 minutes or more to work. In 2018, the mean travel time to work was about 25 minutes for Charlotte residents. Commute times are generally shorter in places that have access to transit and walking/biking options to get to Uptown - like areas along the LYNX Blue Line. This includes the LYNX Blue Line Corridor along South Boulevard as well as the Dilworth and Metropolitan areas that have better biking/walking options and the City LYNX Gold Line Streetcar.

- **24.6** Average Daily Commute Time (Minutes)
- **36.8%** Commute More than 30 Minutes Daily
- **22%** Average Household Income Spent on Transportation (HTA Index)
- **$15,719** Average Annual Household Cost of Driving in Charlotte (City of Charlotte)

76.6% of Charlotteans drive alone on their daily commute.

Exhibit shows that areas where the average annual income is less than $50,500 predominantly have shorter commute times (in most of these neighborhoods, though not all, approximately half of residents have commute times of less than 20 minutes).
Memphis MPO's household travel survey conducted in 2015

<table>
<thead>
<tr>
<th>Memphis 2015 Household Travel Survey</th>
<th>Average Trip Length (in Minutes) by HH Income Level</th>
<th>Overall Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;20k</td>
<td>20-35k</td>
</tr>
<tr>
<td>Home-based Work</td>
<td>18.5</td>
<td>21.5</td>
</tr>
<tr>
<td>Home-based University</td>
<td>17.9</td>
<td>18.8</td>
</tr>
<tr>
<td>Home-based School</td>
<td>12.3</td>
<td>10.5</td>
</tr>
<tr>
<td>Home-based Shopping</td>
<td>12.6</td>
<td>13.7</td>
</tr>
<tr>
<td>Home-based Social-recreational</td>
<td>15.3</td>
<td>16.8</td>
</tr>
<tr>
<td>Home-based pickup drop-off</td>
<td>13.5</td>
<td>12.9</td>
</tr>
<tr>
<td>Home-based other</td>
<td>13.9</td>
<td>15.5</td>
</tr>
<tr>
<td>Non-home-based work</td>
<td>18.1</td>
<td>17.2</td>
</tr>
<tr>
<td>Non-home-based non-work</td>
<td>13.9</td>
<td>15.5</td>
</tr>
</tbody>
</table>

The Exhibit shows that households earning less than $25,000 per year generally have the shortest travel times.
What are Adaptive Signal Control Technologies?

The variability and unpredictability of traffic demand on arterial systems often outpace the ability of local and State agencies to update signal timings so that signalized intersections operate efficiently and do not cause congestion and delays to motorists and pedestrians. The 2007 National Traffic Signal Report Card rated the Nation’s traffic signal management and operations practices with a letter grade of “D” and estimated that poor traffic signal timing contributes to as much traffic congestion and more than 295 million vehicle-hours of delay on major roadways alone. Conventional signal systems do not use pre-programmed, daily signal timing schedules that do not monitor system performance, nor can they adjust automatically to accommodate traffic patterns that are different from the peak periods during which they were designed to operate. Adaptive signal control technologies adjust when green lights start and end to accommodate current traffic patterns to promote smooth flow and ease traffic congestion. The main benefits of adaptive signal control technology over conventional signal systems are that it can:

- Automatically adapt to unexpected changes in traffic conditions.
- Improve travel time reliability.
- Reduce congestion and fuel consumption.
- Prolong the effectiveness of traffic signal timing.
- Reduce the complaints that agencies receive in response to outdated signal timing.
- Make traffic signal operations proactive by monitoring and responding to gaps in performance.

Adaptive Control Software Lite (ACSLite) is a specific adaptive signal control technology developed by the FHWA through a public-private partnership. ACSLite takes advantage of typical signal system architecture and works with existing control, detection, and communications configurations to cost-effectively deliver adaptive control that is easy-to-deploy and produces comparable performance to traditional adaptive systems.
How Does It Work?

By receiving and processing data from sensors to optimize and update signal timing settings, adaptive signal control technologies can determine when and how long lights should be green. Adaptive signal control technologies help improve the quality of service that travelers experience on our local roads and highways.

The process is simple. First, traffic sensors collect data. Next, traffic data is evaluated and signal timing improvements are developed. Finally, the adaptive signal control technology implements signal timing updates. The process is repeated every few minutes to keep traffic flowing smoothly. Traditional signal retiming might only repeat this process every 3 to 5 years.

The traditional signal timing process is time-consuming and requires substantial amounts of manually collected traffic data. Traditional time-of-day signal timing plans do not accommodate variable and unpredictable traffic demands. This results in customer complaints, frustrated drivers, excess fuel consumption, increased delays, and degraded safety. Customer complaints is the most frequently cited performance measure in operations surveys conducted by the FHWA. In the absence of complaints, months or years might pass before inefficient traffic signal timing settings are updated. With adaptive signal control technologies, information is persistently collected and signal timing is updated continually.

Why Adaptive Signal Control Technologies?

- Adaptive signal control technologies deliver improved service to road users.
  - Outdated traffic signal timing currently accounts for more than 10 percent of all traffic delays. On average, adaptive signal control technologies improve travel time by more than 10 percent. In areas with particularly outdated signal timing, improvements can be 50 percent or more.
  - Adaptive signal control technologies also react to unexpected events, such as crashes and special events. By adjusting traffic signal timing in real-time to reflect actual conditions on the road, travelers enjoy a more reliable trip.
  - Studies indicate that crashes could be reduced by up to 15 percent through improved signal timing. Adaptive signal control technology can reduce the intersection congestion that causes many crashes.

- Adaptive signal control technologies solve problems for signal operators.
  - Performance management and acquiring the information necessary to measure performance are challenges facing many transportation agencies. Adaptive signal control technologies capture a rich set of data that signal operators can use to monitor their performance.
  - By solving traffic problems as they occur, adaptive signal control can reduce citizen complaints and frustration. Adaptive signal control technology is a proactive step that signal operators can take to improve service.

- Adaptive signal control technologies provide value.
  - The costs of congestion and delay to road users are substantial, and adaptive signal control technology delivers benefits to users that far outweigh its cost.
  - Adaptive signal control technologies also provide value directly to signal operators. By extending the effectiveness of traffic signal timing plans, implementing adaptive signal control technologies can yield direct savings by reducing the frequency of manually retiming signals.

A wide variety of adaptive signal control technologies are available to operate in varied environments.
FAQs

Where are adaptive signal control technologies most effective?
Adaptive signal control technologies are best suited for arterials that experience highly variable or unpredictable traffic demand for which multiple signal timing solutions are necessary during a typical time-of-day period.

How well does adaptive signal control technology improve system performance?
Many studies have shown that adaptive signal control improves average performance metrics (travel time, control delay, emissions, and fuel consumption) by 10 percent or more. In systems with extremely outdated signal timing, and under saturated conditions, the improvement can be 50 percent or more. Improvement might not be as dramatic in areas where traffic demand is stable and predictable during typical time-of-day periods, performance is regularly monitored, and signal timing is well maintained.

How widely are these technologies used?
Adaptive signal control technologies are widely used in the United Kingdom, Asia, and Australia. In the United States, adaptive signal control technologies are being used on less than one percent of all signalized intersections. The cost of hardware can be an issue, but other barriers include the expertise necessary to configure and maintain the system, a lack of active performance measurement, and myths about the benefits of adaptive signal control technology.

How do I plan to implement adaptive signal control technology?
As with any traffic operations strategy, it is essential that a signal operator identify performance outcomes they wish to achieve; determine their current needs, requirements, and long-range possibilities for their system; identify and pursue regional collaboration and integration; insert into agency plans all the resources necessary to successfully deploy and maintain the system throughout its lifecycle; and monitor performance of the deployed system.

Where can I go for assistance in this planning process?
Contact your FHWA Division Office, who can help you identify experts in planning, operation, and technical issues.

Contact Information

For training or more information on this Every Day Counts Initiative, please contact your local FHWA Division Office.

To learn more about EDC, visit: http://www.fhwa.dot.gov/everydaycounts

Traffic flows smoothly through green lights.

About Every Day Counts

Every Day Counts is designed to identify and deploy innovation aimed at shortening project delivery, enhancing the safety of our roadways, and protecting the environment.