

EXECUTIVE SUMMARY

Project Description

The proposed Streets of Brentwood is a mixed-use development located on the west side of Franklin Road and south side of Maryland Way in Brentwood, TN. According to the developers, H.G. Hill Realty and GBT Realty, the proposed project includes approximately 970,212 square feet of commercial and residential space. Specifically, the current development program includes approximately 413,809 square feet of office space, 140,338 square feet of retail/restaurant space, 251 apartment units, a 1,650-seat movie theater, and a 150-room hotel. Three parking structures are planned to be constructed to accommodate the parking needs for the development. In conjunction with the proposed mixed-use development, a new access is proposed to provide primary access to the existing Hill Center Brentwood shopping center. The purpose of this study is to analyze the traffic impacts associated with the proposed development and evaluate the access for the development as well as the proposed new access for the Hill Center Brentwood. This study also includes a parking analysis to determine the minimum number of parking spaces that will be required to accommodate the development.

Data Collection

In order to provide data for the traffic impact analysis, manual traffic counts were conducted at the following intersections:

- Franklin Road and Maryland Way/Church Street
- Franklin Road and Chadwick Drive/Hill Center Brentwood
- Franklin Road and Executive Center Drive
- Franklin Road and Hill Center (Starbucks) Driveway/Synergy Driveway
- Franklin Road and Williamsburg Road/Brentwood Plaza Access at CVS
- Maryland Way and East Park Drive/Baptist Access
- Church Street and Centerview Drive

Specifically, the traffic counts were collected from 7:00 - 9:00 AM and 4:00 - 6:00 PM on a typical weekday. Ten-hour counts were conducted at the intersections of Franklin Road and Executive Center Drive and Franklin Road and Hill Center (Starbucks) Driveway/Synergy Driveway in order to provide volume data for a signal warrant analysis. Additionally, the two secondary driveways located on Williamsburg Road for the existing Hill Center were counted. From the counts, it was determined that the AM and PM peak hours of traffic flow at the intersections occur from 7:45 - 8:45 AM and 4:00 - 5:00 PM, respectively.

Projection of Future Traffic Volumes

In order to account for the traffic growth prior to the completion of the proposed project, background traffic volumes were established. Site-specific peak hour traffic generated by three off-site developments that are approved or planned but not yet constructed was added to the existing peak hour traffic in order to obtain the background traffic for the study area intersections. Specifically, traffic

that will be generated by the approved Tapestry apartment development on Centerview Drive and the approved office development on Granny White Pike was included in the background traffic volumes. Additionally, traffic expected to be generated by the proposed hotel development in the Synergy Business Park on Centerview Drive was included in the background traffic volumes.

A traffic generation process was used to estimate the amount of traffic expected to be generated by the proposed Streets of Brentwood development. Factors for the trip generation were taken from ITE's *Trip Generation*, Eighth Edition. Internal trips between the proposed uses are expected, which means for example residents in the apartments are likely to patronize the restaurants in the development. Therefore, a process was used to estimate the amount of internal trips that will be made based on the size and mix of land uses. Additionally, studies have shown that most new retail and restaurant developments generate relatively little "new" traffic. The traffic volumes entering and exiting new retail sites are usually either captured ("pass-by") trips from the adjacent street or diverted trips from streets serving other destinations. This traffic will be on the roadway system and will be passing by the site even if the proposed development is not constructed.

Accounting for these adjustments, the proposed mixed-use development is expected to generate approximately 11,836 new vehicle trips per day. The AM and PM peak hour trip generations will equal approximately 850 and 1,102 new trips, respectively. The estimated project-generated traffic volumes were added to the background peak hour traffic volumes in order to obtain the total projected peak hour traffic volumes for the study area intersections.

Conclusions and Recommendations

The analyses presented in this study indicate the impacts of the proposed mixed-use development at Franklin Road and Maryland Way will be manageable by providing the recommendations below. These specific recommendations will provide safe and efficient traffic operations within the study area following the completion of the proposed Streets of Brentwood project. The recommendations are as follows:

Franklin Road and Maryland Way/Church Street

The intersection of Franklin Road and Maryland Way/Church Street should be modified to provide additional capacity for the westbound approach. The following specific improvements should be provided:

- Restripe the east leg of Church Street to provide an exclusive westbound right turn lane within the existing pavement width. The eastbound and westbound travel lanes should be approximately 11 feet wide.
- Install an "Advanced Intersection Lane Control" sign (R3-8) on the westbound approach at the beginning of the right turn lane taper. The sign should indicate two through lanes and one right turn lane are provided.

- Modify the existing pavement striping between Pewitt Drive and Centerview Drive in order to transition between the 5-lane section of Church Street and the proposed 6-lane section.
- Modify the dotted lane line extension for the southbound dual left turn lanes to align with the proposed striping on the east leg.
- Modify the existing signal design and phasing to provide a right turn overlap phase for the westbound approach. The signal heads for the westbound approach may need to be repositioned due to the proposed lane alignment on the east leg.

The recommended improvements for the intersection of Franklin Road and Maryland Way/Church Street are illustrated in Figure 8a.

Franklin Road and Garage Access

Access to the Parking Garage on Franklin Road should be designed to allow right turns in, left turns in, and right turns out. The following specific improvements are recommended:

- A right turn lane should be constructed on the southbound Franklin Road approach to the proposed garage access. The right turn lane should include approximately 75 feet of storage and 50 feet of taper.
- The access should include one entering lane and one exiting lane.
- The access should be designed to accommodate right turn and left turns into the site. Left turns exiting the site should be prohibited by constructing an island, which channelizes exiting traffic to turn right on to southbound Franklin Road.
- A “No Left Turn” sign (R3-2) should be installed on the eastbound site access approach.
- Northbound left turns into the project site can be accommodated by the inside left turn lane.

The recommended improvements for the intersection of Franklin Road and the proposed garage access are illustrated in Figure 8a.

Franklin Road and Chadwick Drive/Site Access

The signalized intersection of Franklin Road and Chadwick Drive will provide primary access to the proposed mixed-use development as well as secondary access to the existing Hill Center Brentwood. The following improvements are recommended:

- The site access should be widened to provide a minimum of three exiting lanes and one entering lane. The three exiting lanes should include one left turn lane, one through lane, and one right turn lane each with approximately 120 feet of storage.
- Restripe the east leg of Chadwick Drive to provide three 11-foot westbound lanes and one 14-foot eastbound lane. The westbound approach should include one left turn lane, one through lane, and one right turn lane.

- Install an “Advanced Intersection Lane Control” sign (R3-8b) at the beginning of the westbound right turn lane taper.
- Modify the existing signal design and phasing to provide an eastbound right turn overlap phase.
- Install pedestrian crosswalks on the north, east, and west legs.

The recommended improvements for the intersection of Franklin Road and Chadwick Drive/Site Access are illustrated in Figure 8b.

Franklin Road and Executive Center Drive/New Hill Center Access

Primary access to the existing Hill Center Brentwood is proposed to be relocated to a new access aligned with Executive Center Drive. Analyses indicate the projected traffic volumes at the intersection will warrant the need for a traffic signal. The following specific improvements are recommended:

- Align the new Hill Center Access with Executive Center Drive. Provide one left turn lane with approximately 120 feet of storage and one shared through/right turn lane.
- Install a traffic signal at the intersection of Franklin Road and Executive Center Drive. The traffic signal design and phasing should provide protected/permissive left turn signal phasing for all approaches. The new traffic signal should also include pedestrian signals and pushbuttons for each leg of the intersection.
- Provide pedestrian crosswalks for each leg of the intersection.
- The westbound approach of Executive Center Drive should be restriped to include one left turn lane and one shared through/right turn lane.
- Provide exclusive left turn lanes within the existing two-way left-turn lane for the northbound and southbound approaches. Approximately 100 feet of storage and 75 feet of open taper should be provided.
- Provide a northbound right turn lane within the existing shoulder. The turn lane should include approximately 115 feet of storage and 75 feet of taper. It should be noted that a northbound right turn lane is not needed to accommodate the proposed H.G. Hill/GBT development. This improvement should be provided with the recommended traffic signal to improve access to the existing Synergy Business Park and planned hotel.

The recommended improvements for the intersection of Franklin Road and Executive Center Drive/New Hill Center Access are illustrated in Figure 8c.

Maryland Way and East Park Drive/Site Access

Primary access to the proposed development will be provided at the signalized intersection of Maryland Way and East Park Drive. The site access is proposed to align with East Park Drive, forming the fourth leg of the intersection. Specifically, the following improvements are recommended at this intersection:

- The site access should be aligned with East Park Drive and include a minimum of two exiting lanes and one entering lane. The exiting lanes

should include one left turn lane with approximately 85 feet of storage and one shared through/right turn lane.

- Construct an eastbound right turn lane on Maryland Way with approximately 90 feet of storage and 60 feet of taper.
- Extend the eastbound left turn lane storage approximately 80 feet by removing the median and providing channelized striping.
- Restripe the southbound approach of East Park Drive to provide one shared left turn/through lane and one right turn lane.
- Install an “ONLY” pavement marking to supplement the existing right turn lane arrow for the southbound approach of East Park Drive.
- Install an “Advanced Intersection Lane Control” sign (R3-8) at the beginning of the southbound right turn lane taper. Install a “Right Lane Must Turn Right” sign (R3-7) on the southbound approach.
- Modify the existing traffic signal design and phasing to provide protected/permissive left turn signal phasing for the northbound approach and permissive left turn phasing for the southbound approach. Additionally, provide right turn overlap signal phasing for the southbound and eastbound approaches.

The recommended improvements for the intersection of Maryland Way and East Park Drive/Site Access are illustrated in Figure 8d.

Maryland Way and West Garage Access

Access to the West Parking Garage on Maryland Way should be designed to allow right-in/right-out access only. The following specific improvements are recommended:

- The access should include one entering lane and one exiting lane.
- The access should be designed to accommodate right turns into and out of the site. Left turns entering and exiting the site should be prohibited by constructing a right-in/right-out channelizing island.
- A “No Left Turn” sign (R3-2) should be installed on the northbound site access approach.

Maryland Way and East Garage Access

Access to the East Parking Garage on Maryland Way should be designed to allow right-in/right-out access only. The following specific improvements are recommended:

- The access should include one entering lane and one exiting lane.
- The access should be designed to accommodate right turns into and out of the site. Left turns entering and exiting the site should be prohibited by constructing a right-in/right-out channelizing island.
- A “No Left Turn” sign (R3-2) should be installed on the eastbound site access approach.

Development Parking

For development sites with a mixture of uses, the overall peak parking demand can be significantly less than the sum of the peak parking demands of the individual uses since different types of uses have different peaking characteristics. Therefore, a shared parking analysis was conducted for the proposed Streets of Brentwood development. The results of the shared parking analysis indicate, that a minimum of 2,499 parking spaces will be required in order to accommodate the peak parking demand for the development. This is a 25% reduction over the typical City of Brentwood Zoning Ordinance parking requirements. The parking demand reduction accounts for the ability to accommodate shared parking between land uses. However, it is recommended to provide a parking supply surplus over the peak demand of 2,499 parking spaces in order to provide circulation efficiency within the development. It should be noted that a shared parking analysis should be revised if the proposed development program is modified.

In summary, based on the analyses conducted, no further recommendations are presented for the proposed Streets of Brentwood development.

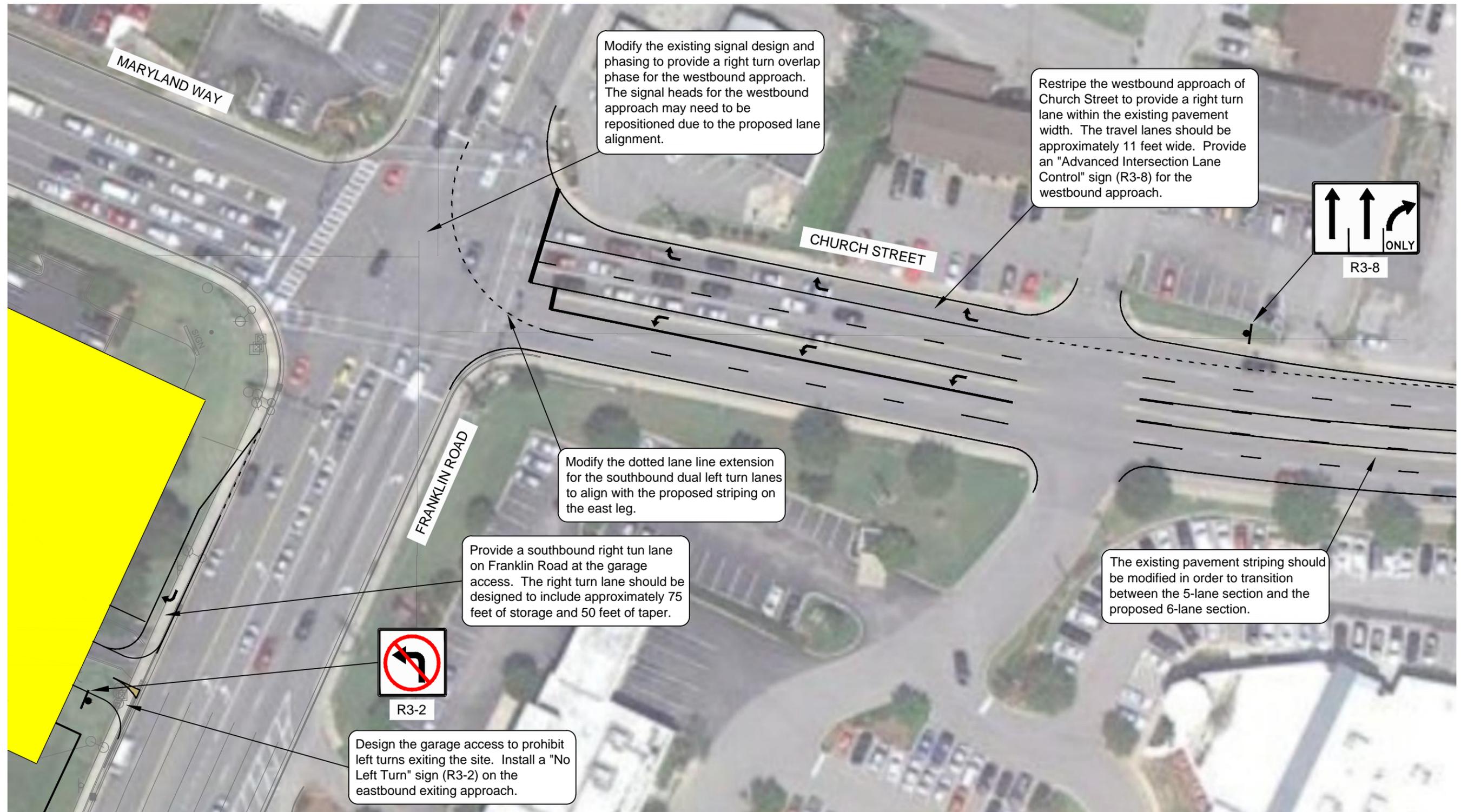
Project Benefits

From a transportation perspective, the proposed project introduces several benefits to the area. First, the proposed development has a diverse mixture of uses, which allows for shared trips between land uses. This means that not all patrons of the retail/restaurant will be new vehicular traffic. Rather a large portion of the development traffic will be walking trips between land uses. For instance, some office workers will likely visit the retail/restaurant uses before leaving the development in the evenings. The current plan indicates the various land uses will be located in close proximity to each other, primarily because structured parking will be provided rather than large surface lots. The short distances between land uses increases the walkability of the development and will further encourage shared trips among land uses.

The existing zoning would allow for approximately 760,000 square feet of office space, which would generate similar total volumes during the AM and PM peak hours. However, the traffic generated by an office-only development of this size would be more intensive due to the directional characteristics of office traffic. During the AM peak hour, an office development under the existing zoning would generate approximately 201 more vehicle trips entering the site than the proposed mixed-use development. During the PM peak hour, an office development under the existing zoning would generate approximately 105 more vehicle trips exiting the site than the proposed mixed-use development. In general, office parks can have a greater impact to the roadway network during peak commuting hours than a development with a good mix of uses that complement each other such as the proposed Streets of Brentwood development.

The proposed development provides opportunities for physical improvement to the existing roadway and pedestrian infrastructure. The proposed site plan identifies a new roadway connection between Franklin Road to the southeast and Maryland Way to the northwest. This new street network link is expected to attract a portion of the existing traffic that currently travels through the intersection of Franklin Road and Maryland Way/Church Street, particularly during peak hours.

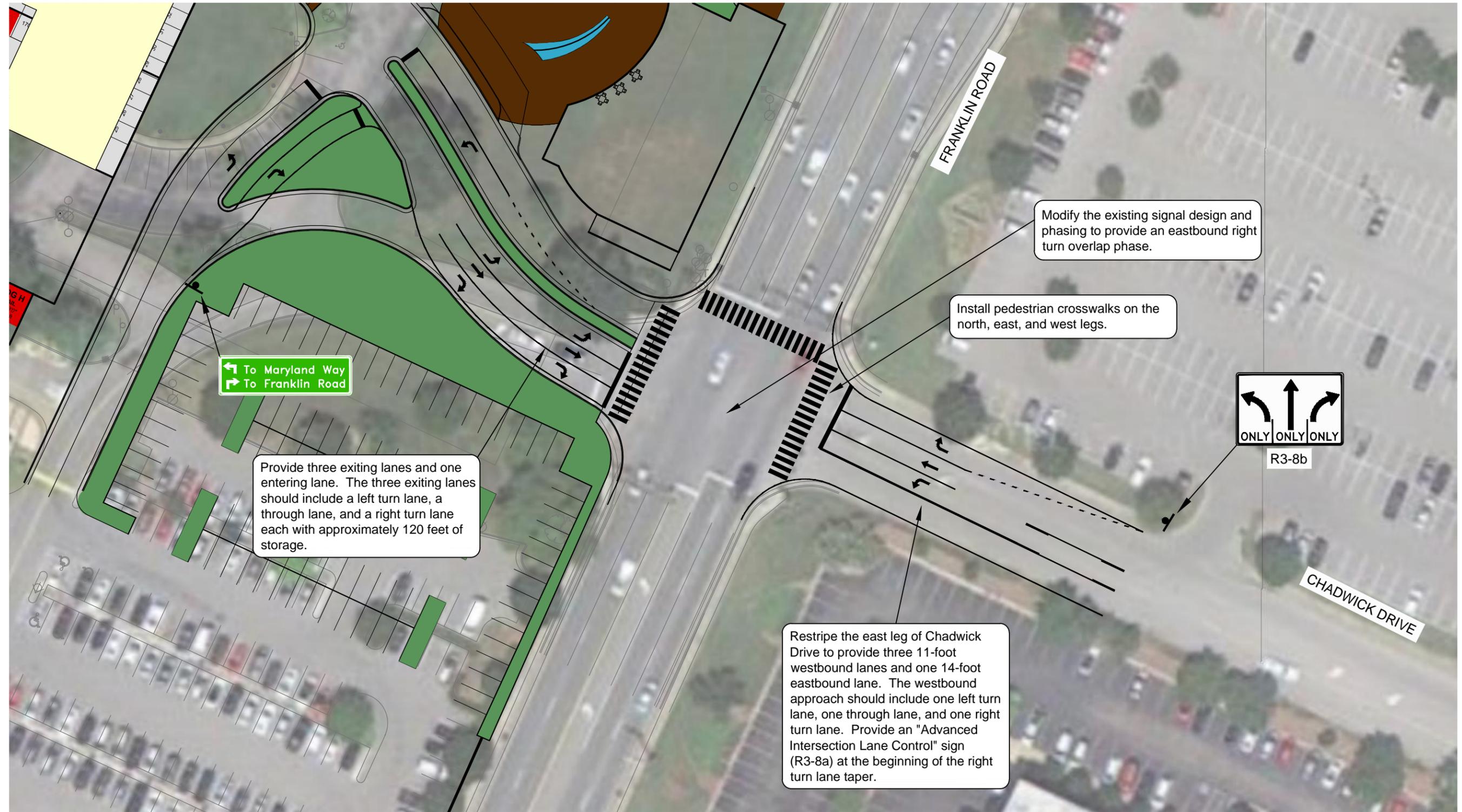
While the proposed development will generate new vehicular traffic to the study area, the impact of the proposed development will be manageable by providing the roadway and intersection design improvements recommended in this study.



Recommended Improvements - Franklin Road and Maryland Way/Church Street



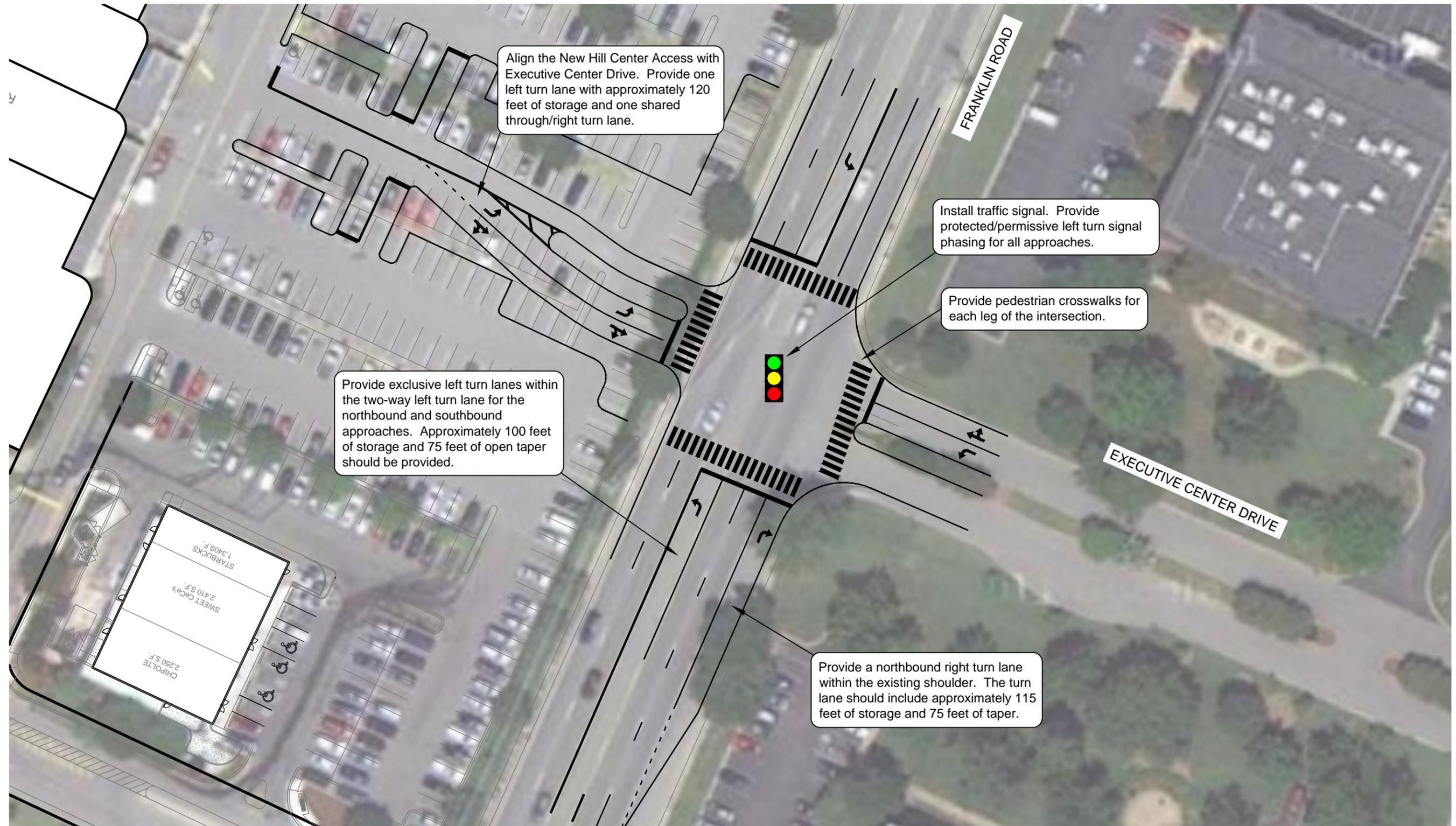
Figure 8a.



Recommended Improvements - Franklin Road and Chadwick Drive/Site Access



Figure 8b.



Recommended Improvements - Franklin Road and Executive Center Drive/New Hill Center Access

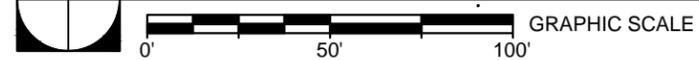


Figure 8c.



Recommended Improvements - East Park Drive and Maryland Way



Figure 8d.