

**TECHNICAL
MEMORANDUM - DRAFT**

To
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Chapel Hill Transit

From
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Cc
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HNTB Project File: 38435

Subject
Obey Creek –
Detailed Transit Analysis Update

Date
02/10/15

Per Town of Chapel Hill request related to the *Obey Creek Mixed-Use Development Transportation Impact Study*, the following information represents a requested revised methodology and results related to potential transit service impacts due to anticipated transit trip generation for the Obey Creek mixed-use development project.

Obey Creek Initial Detailed Transit Analysis

In October 2014, HNTB produced the *Obey Creek TIS Detailed Transit Analysis Technical Memorandum* which analyzed potential impacts to existing Chapel Hill Transit (CHT) bus service due to the Obey Creek development. This document contained methodologies that estimated ridership impacts to four existing potential service routes (NS, V, CCX, and PX) that could potentially serve the Obey Creek site. Data from that documentation was utilized and refined for this Detailed Transit Analysis Update.

Revisions to Initial Detailed Transit Analysis

Per request from CHT staff, data from the initial transit study was refined to show impacts in the estimated 2022 Obey Creek build-out year through projected “No-Build” and “Build” loads and capacities. Capacity estimates of “average” buses on each route were refined to provide both a “maximum” capacity per bus and a “service” capacity, which represents 80 percent of “maximum” capacity. “No-Build” and “Build” loads were estimated based on methodologies developed in the original Detailed Transit Analysis document and graphical comparisons were made along each route to determine, at each stop, whether or not additional capacity was needed for the AM, noon, or PM peak hours analyzed. These peak hours are reflective of peak traffic and trip generation hours for the Obey Creek site and do not necessarily directly correspond with existing peak CHT transit service hours on the individual routes studied.

Estimates of additional “net” bus capacity were also made with the consideration that an additional bus applied to a given route will supply a “net” amount of additional seat capacity given the number of existing buses and headways based on current service during each peak hour.

Obey Creek Route Capacity Impacts

To gain insight into potential impacts to future transit service along the existing CHT routes due to potential ridership increases from the Obey Creek development, an assessment of overall average route capacity was conducted for the AM, noon, and PM peak weekday hours. No straightforward method exists to proportion estimated daily Obey Creek transit trips and apply them to existing daily service for the existing NS, V, CCX and PX routes.

Existing boarding, alighting and average load data provided by CHT was utilized for the entire length of the four current routes and Obey Creek-related transit trips were proportioned along the route by assuming existing patterns of boarding and alighting at each specific stop would also apply to Obey Creek transit trips. Thus, 2022 analysis year estimates of No-Build and Build loading capacity conditions were estimated for each route and each stop. For example, southbound Obey Creek-generated transit trips on the NS Route to the Obey Creek site proportionally board along the route based on existing boarding patterns and then alight at the Southern Village Park-and-Ride (adjacent to the Obey Creek site). Similarly, northbound NS Route trips from the Obey Creek site board at the Park-and-Ride area and alight along the route in a proportional manner that matches existing southbound NS Route alighting data. These assumptions also apply to the V Route, and also to the two Express Routes that traverse past the Obey Creek site (with the additional assumption that a stop for Obey Creek-related transit trips could be made).

No potential transfers from these existing routes to other CHT existing service routes were assumed. It was also assumed that Obey Creek peak hour transit trips would be equally divided (and averaged) over each existing route for the number of buses during each peak period that would be serving Obey Creek.

The results of this analysis – and those presented in the Exhibits on previous pages – do not account for the impact of other large development projects in the area (Carolina North, The Edge, Glen Lennox) that may also have impacts on future transit growth on the routes analyzed for this study.

The charts on the following pages summarize the results for each route and weekday peak hour.

EXHIBIT 1. 2022 NS Route No-Build/Build Projected Load & Capacity Results - Northbound

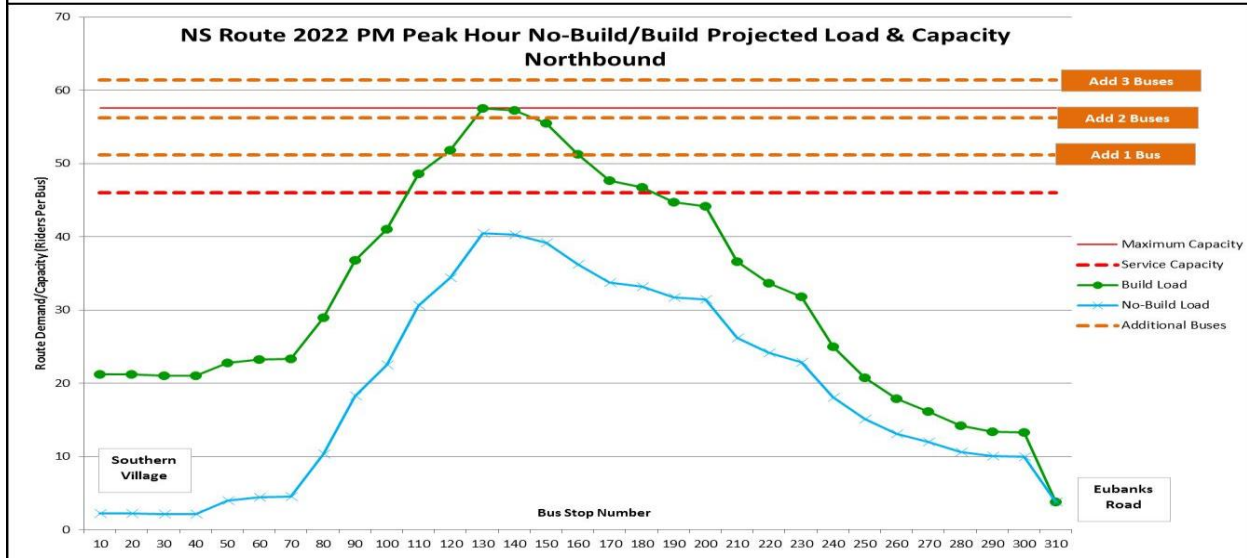
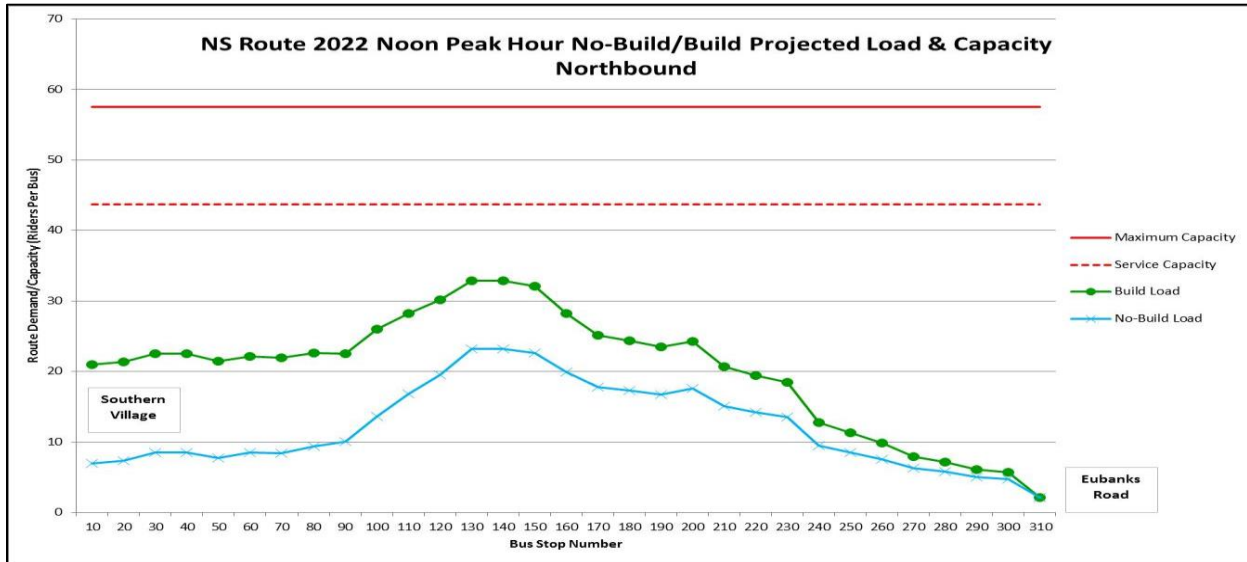
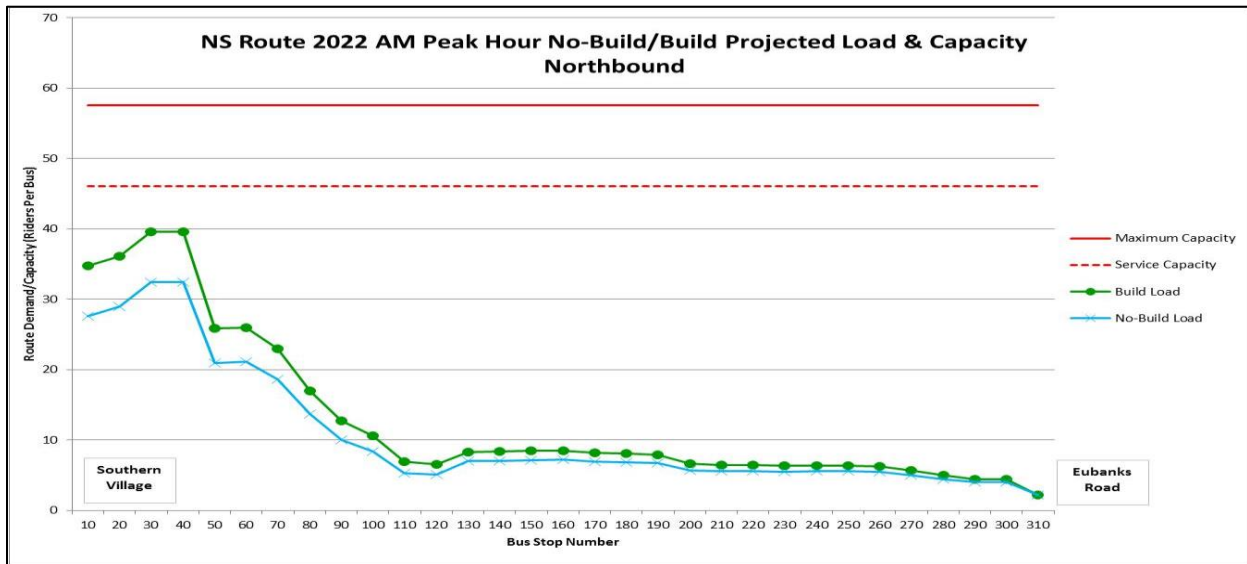


EXHIBIT 1. 2022 NS Route No-Build/Build Projected Load & Capacity Results - Southbound

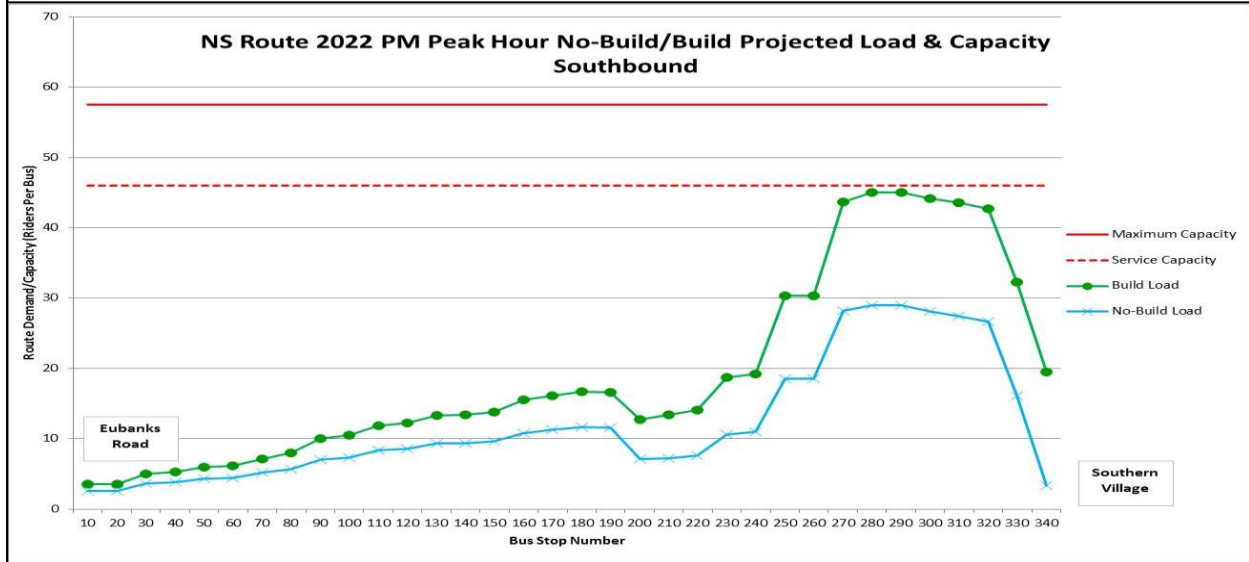
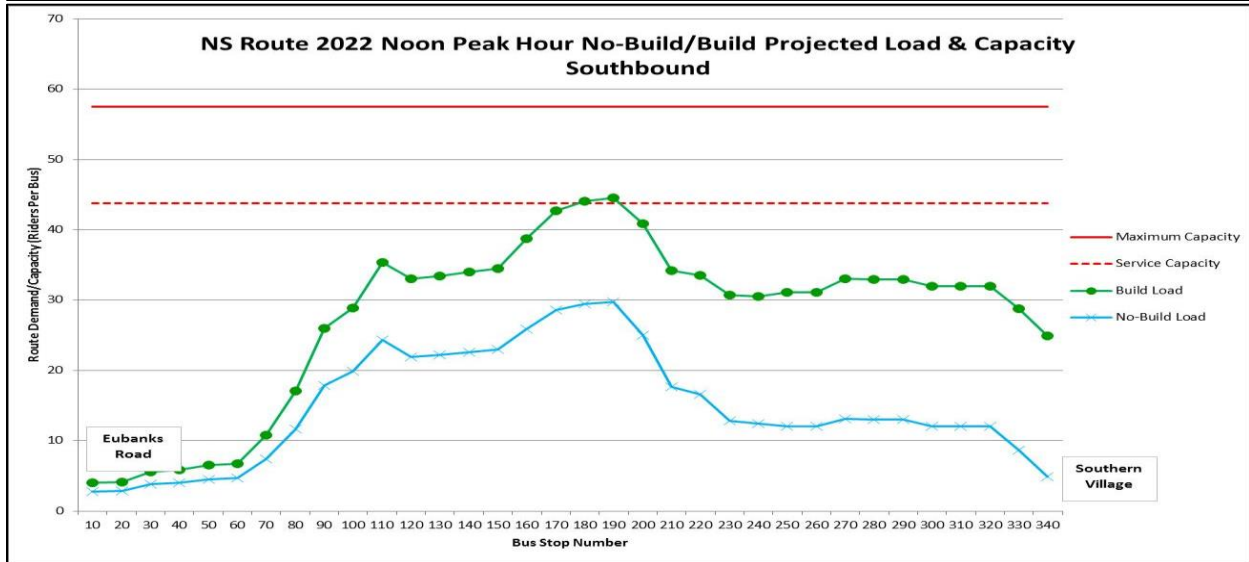
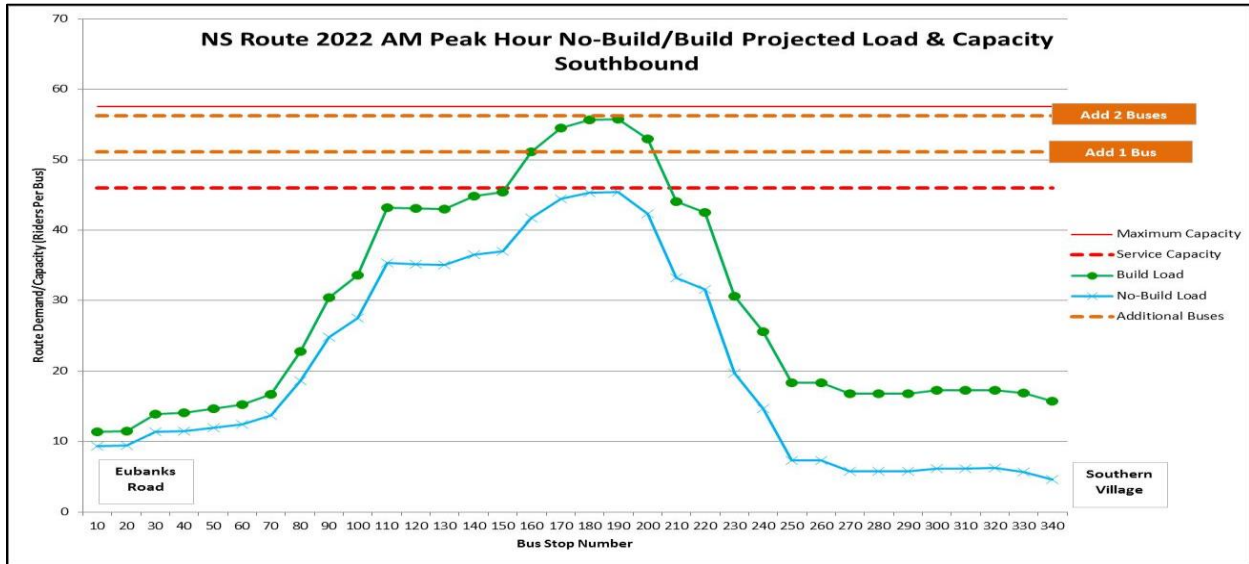


EXHIBIT 2. 2022 V Route No-Build/Build Projected Load & Capacity Results – Northbound

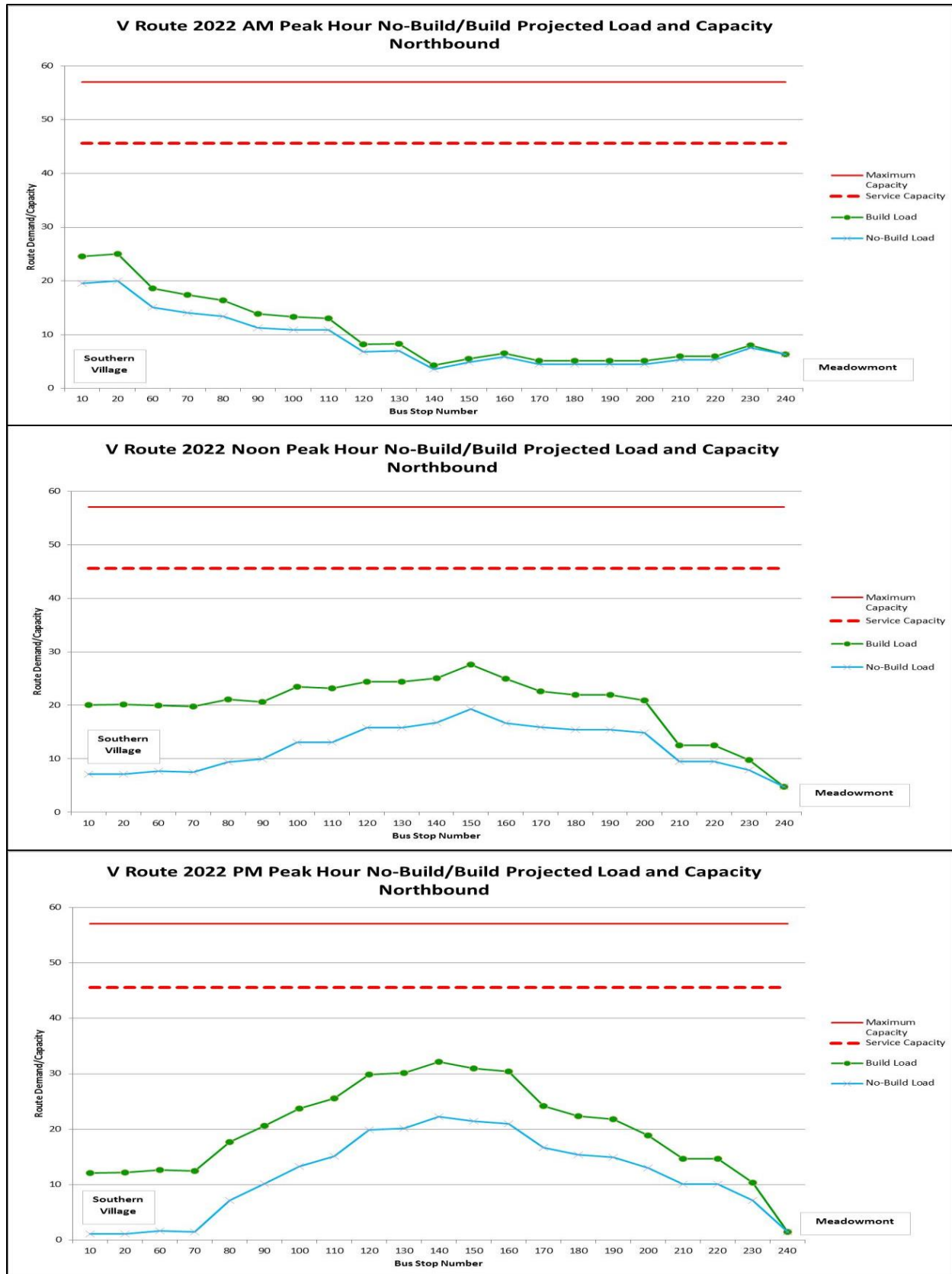


EXHIBIT 2. 2022 V Route No-Build/Build Projected Load & Capacity Results – Southbound

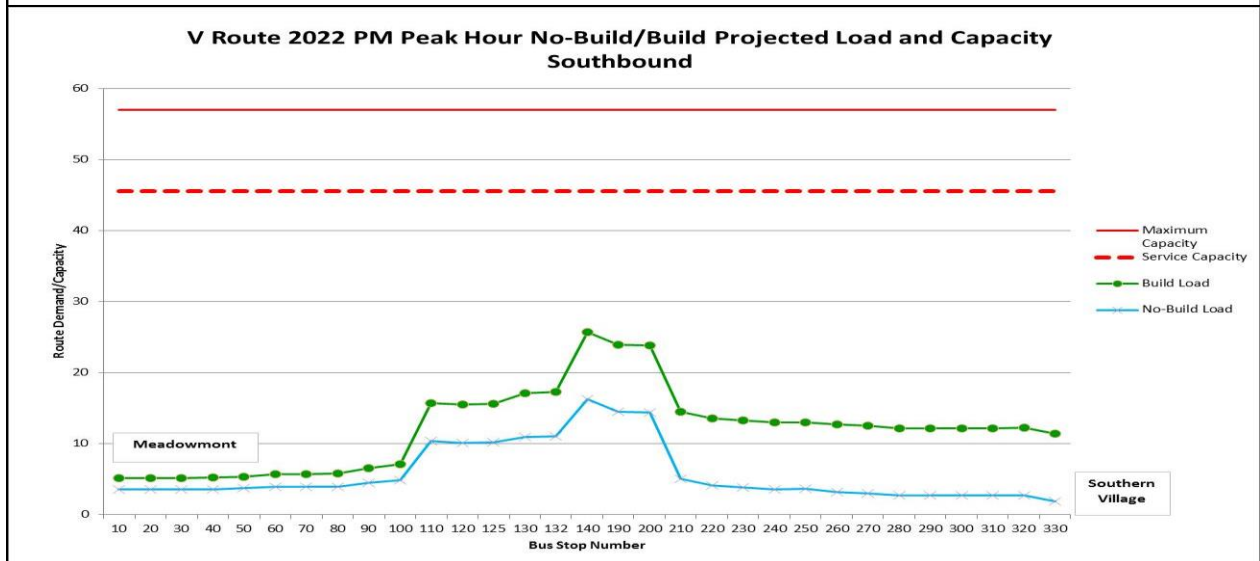
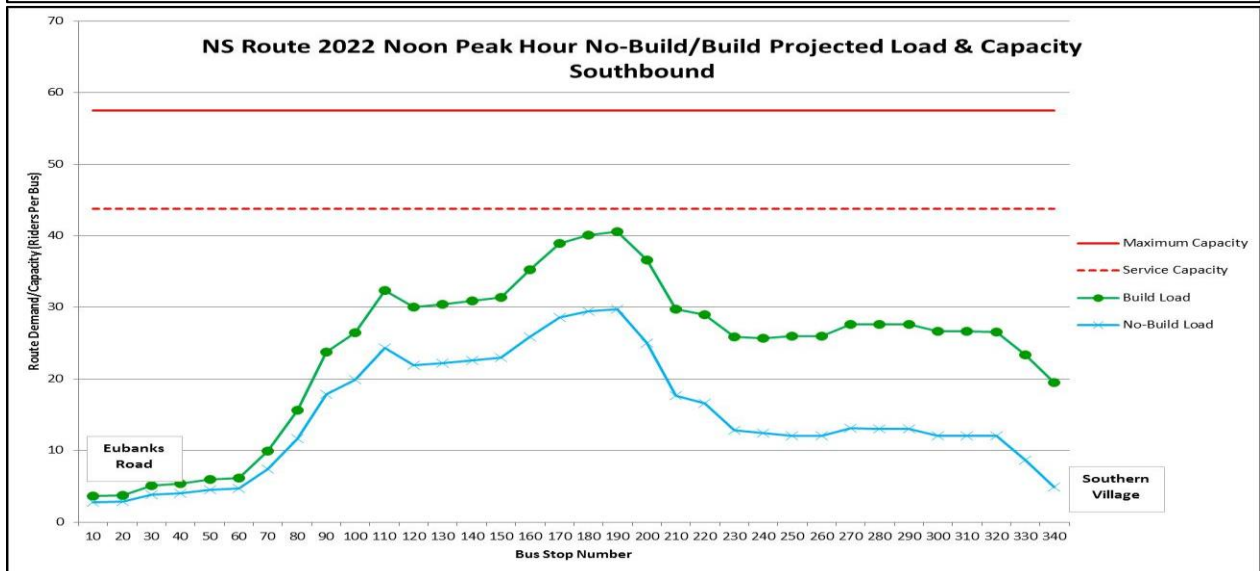
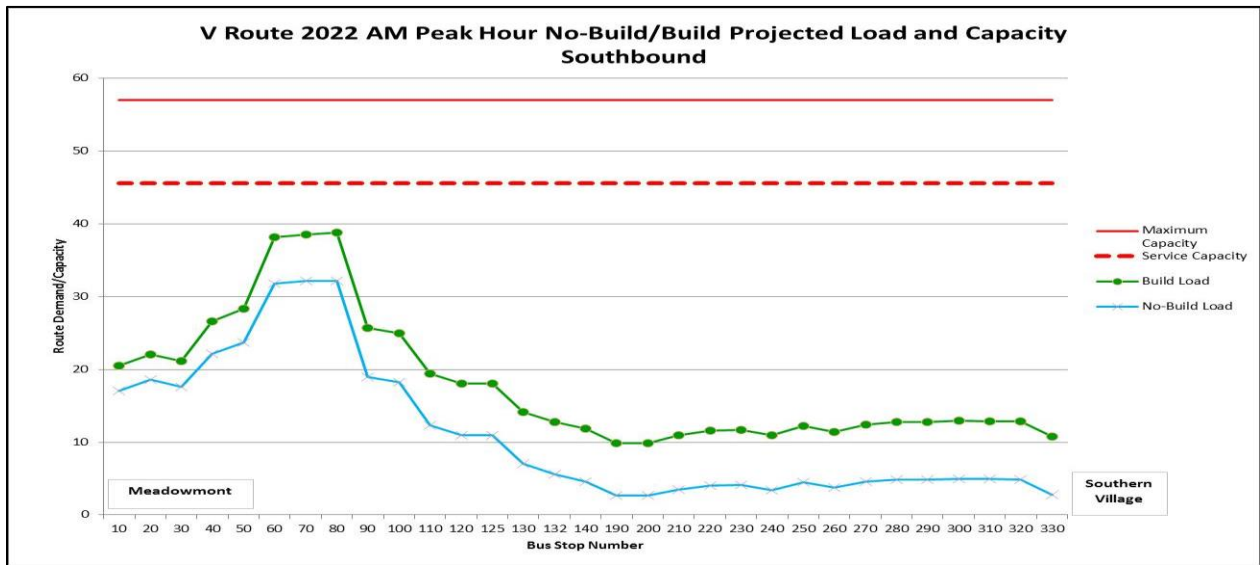


EXHIBIT 3. 2022 CCX Route No-Build/Build Projected Load & Capacity Results - Northbound

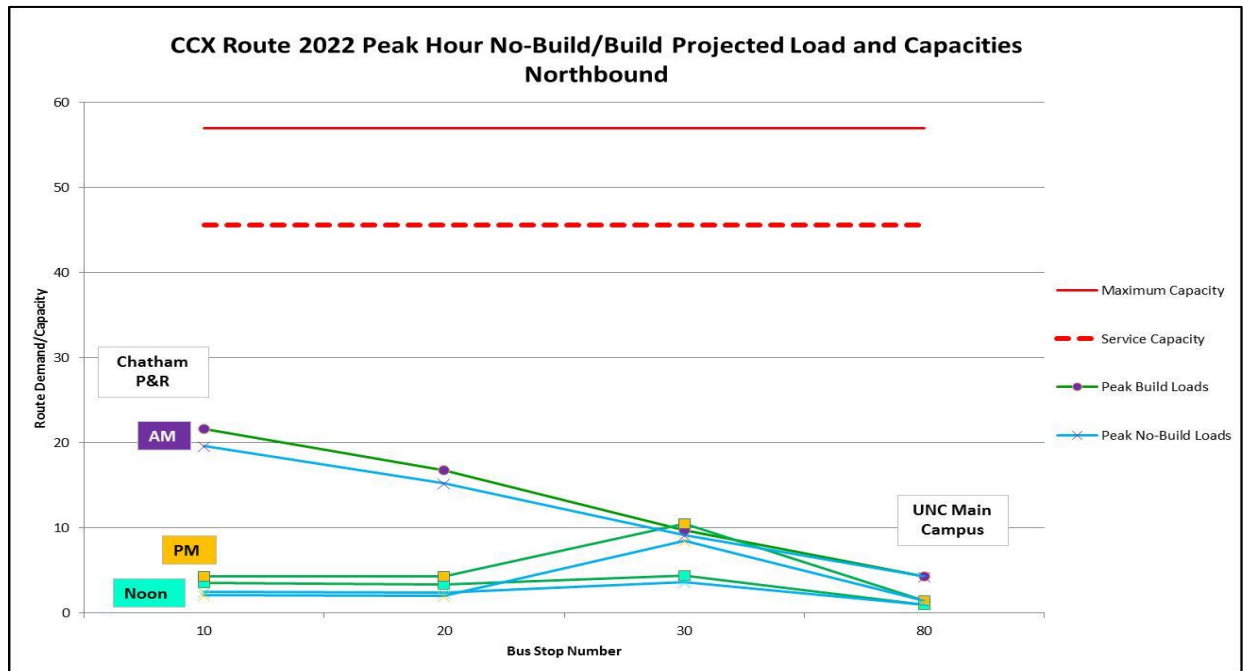
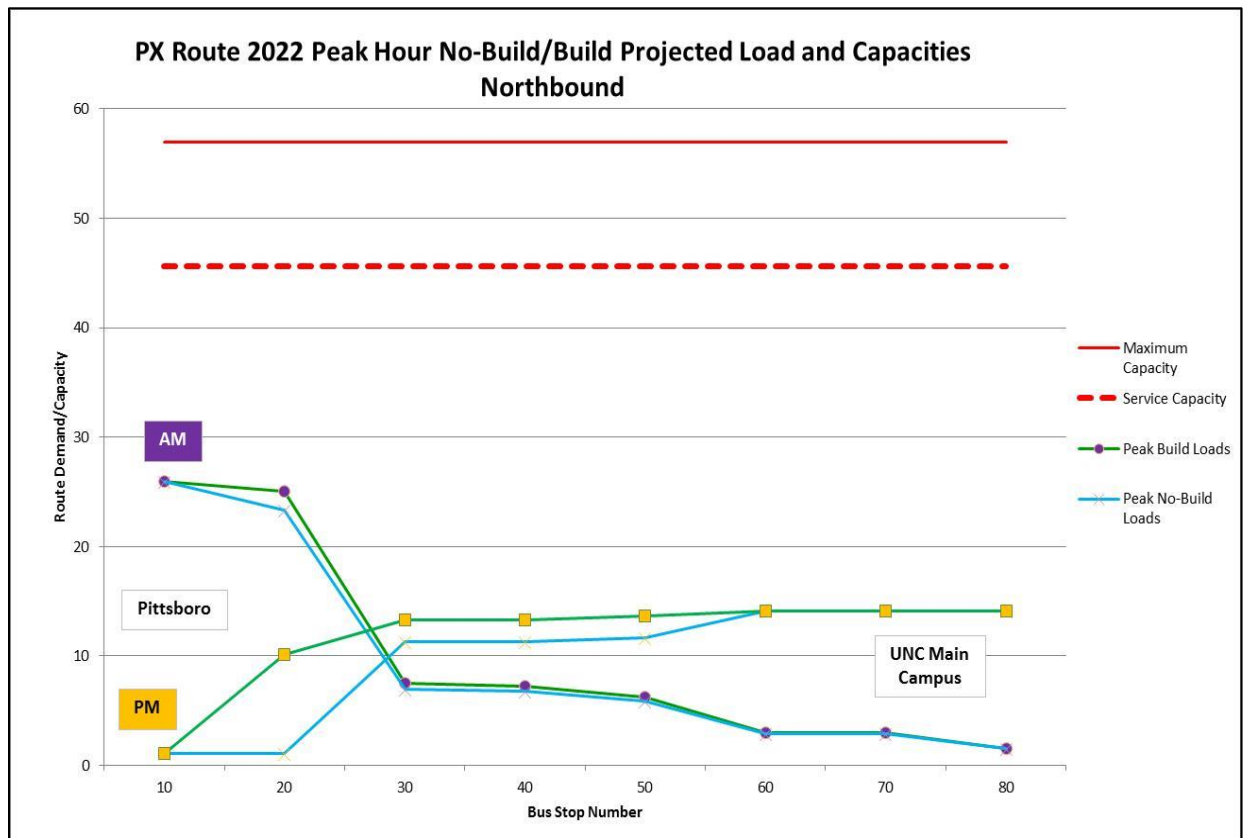


EXHIBIT 4. 2022 PX Route No-Build/Build Projected Load & Capacity Results - Northbound



The following conclusions related to peak hour service capacity can be made from the results shown in the charts in Exhibits 1-4.

- The NS Route is expected to exceed its loading capacity threshold (as defined as 80% of an individual bus’s maximum load capacity) along its northbound route through downtown Chapel Hill/UNC Main Campus extending to the Estes Drive area due to projected Obey Creek-related boarding impacts in the PM peak hour. 2022 No-Build available capacity is less than 10 passengers in this area, and estimated boardings for riders heading from Obey Creek into north Chapel Hill could cause overall demand to exceed available loading capacity by up to 10 riders in this section. Northbound route load capacity is expected to be adequate in the AM and Noon peak hours.
- The southbound NS route loading capacity in 2022 drops to nearly 0 in the downtown Chapel Hill area under No-Build conditions. With added riders generated by Obey Creek and boarding on NS buses along its southbound route in the AM peak hour, ridership demand may exceed service capacity by almost 10 passengers. This occurs along NC 86 (Martin Luther King, Jr. Blvd) between the stops at Airport Gardens Apartments (near Bolinwood Drive) and the UNC Main Campus (Frat Court). Southbound route load capacity during the Noon and PM peak hour time periods is expected to be adequate, although PM peak service capacity is nearly exceeded with the addition of Obey Creek transit trips between UNC Hospitals and Bennett Road.
- All other routes (V, CCX, and PX) are anticipated to provide adequate service capacity, even with the addition of Obey Creek transit trips along these routes, for all 2022 weekday peak periods.

To establish a comparison of demand (not related to service load capacity) along the existing NS route to estimates of transit trip demand from the Obey Creek development, daily and peak hour boardings from existing NS data were extrapolated by the 1.2 growth factor (the factor was explained in the initial Detailed Transit Study) to provide estimated 2022 overall total northbound and southbound boarding estimates. These estimates were then compared with Obey Creek projected boarding (alighting on the northbound NS route) and alighting (boarding on the southbound NS route) information. Table 1 provides a summary of those results.

Table 1. Comparison of Potential Obey Creek Ridership to Projected 2022 NS Route Boardings

Northbound NS Route	Obey Creek Riders	2022 Projected NS Boarding Totals	Overall Total	Obey Creek % of Total Boardings
AM Peak Hour	43	239	282	15%
Noon Peak Hour	42	110	152	28%
PM Peak Hour	114	275	389	29%
Daily	1282	2,288	3570	36%
Southbound NS Route	Obey Creek Riders	2022 Projected NS Boarding Totals	Overall Total	Obey Creek % of Total Boardings
AM Peak Hour	67	302	369	18%
Noon Peak Hour	44	136	180	24%
PM Peak Hour	97	254	351	28%
Daily	1282	2,199	3481	37%

As shown in **Table 1**, projected transit ridership to/from Obey Creek would represent a fairly significant portion of total boardings for all peak hour periods and for daily service, where it may account for nearly 1/3 of all boardings along the NS Route. As described previously, the peak hours analyzed in **Table 1** are the vehicular peak hours of a typical weekday in the Edge’s project study area. They do not directly correspond to the exact NS Route peak demand hours, although they represent demand levels that are relatively close to the actual transit peaks.