



Community Planning & Permitting

Courthouse Annex • 2045 13th Street • Boulder, Colorado 80302 • Tel: 303.441.3930

Mailing Address: P.O. Box 471 • Boulder, Colorado 80306 • www.bouldercounty.org

To: Phil Kleisler

From: Hannah Hippely, AICP, Long-Range Planning Manager

Subject: CU South Annexation

Date: 6/28/2021

Boulder County's Department of Community Planning & Permitting has the following comments related to the materials that we have reviewed related to the annexation, the City of Boulder Annexation Briefing Book dated April 2021, Version 2 and the Traffic Impact Study.

The property is within Area II of the Boulder Valley Comprehensive Plan (BVCP) and is eligible for annexation under the BVCP. In addition to the policies found in sections 1-8, the BVCP includes a section titled CU South Guiding Principles.

Cooperative planning is a cornerstone of the BVCP and collaboration is a guiding principle of the CU South element of the BVCP. County staff is available to meet with city, CU, and CDOT staff to review the concerns, questions, and suggestions identified from our review and discuss potential solutions and/or mitigation strategies.

Land Use Mix

Staff has concerns that the BVCP principles related to Land Use Mix are not adequately addressed at this time. The CU South Guiding Principles state:

1. Housing for university needs: Housing on the site will meet the needs of university faculty, staff and non-freshmen students in order to address the fact that Boulder housing is currently unaffordable to faculty, staff and students.
2. Residential units and non-residential space:
 - a. Housing will be the predominant use of the site for areas not used for flood mitigation (i.e., with a target of 1,100 residential units and the final number guided by transportation performance and other site constraints), although the site may include a mix of residential and non-residential facilities. The site will emphasize housing units over nonresidential space (jobs) to help balance jobs and housing in the community.
 - b. Except for recreation facilities, development will be phased such that non-residential space will be phased after a significant amount of housing is built. Later phases will be dependent on demonstrating that initial phases achieve objectives of mitigating impacts.
 - c. The overall non-residential space footprint will be minimized and support and benefit the convenience of the residents, employees and visitors to residential and recreational uses of the property.

- d. The exact amount, types and location of residential and non-residential space will be refined to minimize impacts as a longterm master plan is developed and as transportation analysis is conducted.
 - e. Academic facilities will include space for research and/or education pertaining to natural environment, such as ecological restoration, floodplains and related topics.
- Per the briefing book “CU Boulder proposes that 100 residential units will be constructed prior to any non-residential buildings (excluding mixed use buildings and recreation)”. This minimal commitment to the provision of housing and the phasing of it does not appear to be in accordance with the guiding principles. A much stronger commitment to housing, the amount of housing and the amount of non-residential area, and a phased approach which prioritizes the construction of housing over non-residential uses should be included in the annexation agreement.
 - It isn’t clear what non-residential uses CU is proposing on the site or how much of the site and relative amount of floor area will be dedicated to these non-residential uses. The principles of the CU South section of the BVCP are clear in the direction that housing should be the primary use of the site. Additional detail on this topic should be provided and the terms of the annexation agreement should ensure this outcome by defining the parameters of non-residential uses and the expectations on the amount of housing that will be provided and when it will be provided.

3. Use restrictions: The site will not include largescale sport venues (i.e., football stadium), high rise buildings (maintaining substantial consistency with the city’s height limits), large research complexes, such as those on East Campus, roadway bypass between Highway 93 and Highway 36 or first-year student housing.

- A large amount of recreation fields are proposed but little explanation about the use of these fields or the total amount is provided. There is potentially a conflict with this proposed use and the prohibition on largescale sport venues. More details on this topic should be provided and parameters on the use established as part of the annexation agreement.
- Roadway bypass between Highway 93 and Hwy 36 is prohibited. The proposal does not provide a clear explanation or description of how the proposed HWY 93 access point will be used and how the intent of the use restriction will be incorporated into the annexation agreement.

TRANSPORTATION

Section 6 of the BVCP envisions a safe, accessible, and sustainable multimodal transportation system and incorporates Vision Zero safety goals. Staff has concerns about the proposal’s ability to implement the vision and goals spelled out the BVCP.

Traffic Impact Study Evaluation

Assumption on Saturation Flow Rates - In section 3.2 it states that the analysis assumed a maximum flow rate of 2,100 passenger cars per lane per hour, stating that this is what was

found to be on East Arapahoe Corridor Project. East Arapahoe is not analogous to several key sections of the study area, specifically Table Mesa between Broadway and US 36. The East Arapahoe corridor has dedicated left turns and raised medians preventing any left turning traffic occurring anywhere other than the dedicated left turn lanes. This prevents left turning vehicles from blocking through traffic – particularly important when traffic volumes are high and left turning vehicles can have difficulty finding traffic gaps. Actual maximum flow rate depends on a number of important variables that are unique to each corridor. This includes:

- Number of buses in the corridor. Increased number of buses reduces the maximum flow rates because buses are slower than passenger cars (in acceleration and deceleration) and stop in the travel lane to pick up and alight passengers. Note that while Arapahoe only has the JUMP, Table Mesa has the AB, the FF1, the FF2, the FF5, the DASH, the 204 and the 206 (select trips).
- Number of pedestrians. Increased pedestrians reduce maximum flow rates as minimum green times for cross streets are more likely to be required.
- Lane width. Narrower lanes reduce maximum flow rates. The HCM default values are 1,900 pcplph but assume 12' lanes. The City of Boulder uses 11' lanes for several good reasons but this reduces the maximum flow rate. (Note, Arapahoe has a mix of 11' and 12' lanes)
- Unsignalized, full movement cross streets. As described above, increased number of cross streets reduces the maximum flow rate.
- Signal parameters including cycle length and Leading Pedestrian Intervals.
- Width adjacent to vehicle lanes (Lateral Clearance).
- Presence of pedestrian Mid-Block Crossings. Table Mesa between Broadway and US36 has two signalized mid-block crossings. This could reduce the maximum flow rates, however, this could be mitigated by signal coordination of up and downstream signalized intersections.

Since the intersection LOS – basically the punchline of the Traffic Impact Study – comes directly from the volume over capacity ratio, the capacity – or maximum flow rate – is extremely important to get correct. Moreover, the analysis shows that many of the intersections are very close to getting to LOS F and it is likely that reducing the maximum flow rates could push those intersection into LOS F either for the background conditions or for the background plus projected traffic. This could have major implications for the mitigation measures required of CU for the development, including hundreds of thousands of dollars in capital improvements.

Its recommended that peak hour maximum flow rates be empirically collected for the project area.

New Vehicle Access to CO 93

This new access does not appear to meet CDOT's Access Control Standards and given the hill and curve we disagree that there is substantial visibility to the north of the proposed intersection. The study concludes that only 800 feet of visibility to the north is required and that this is met. The 800 feet, however, is dependent upon CDOT lowering the posted speed limit from the current 50 mph to 40 mph. CDOT typically only changes posted speed limits if recent data collection shows that the 85th percentile of all vehicle speeds warrant a change. It is very unusual – though theoretically possible – for CDOT to actually *lower* speed limits based on empirical evidence. The analysis instead should assume that CDOT will keep the 50mph speed limit and use 1000 feet of required sight distance as a starting point.

Table 4 - 2: Entering Sight Distance (in feet)

Vehicle expected to enter or cross highway as determined from table 4-3	Posted Speed of Roadway in MPH									
	25	30	35	40	45	50	55	60	65	70
Two Lane Roadway										
Passenger Cars, Pickup Trucks	250	300	350	400	450	500	550	600	650	700
Single Unit Trucks Over 10,000 lb GVW	325	390	455	520	585	650	715	780	845	910
Multi-Unit Trucks	425	510	595	680	765	850	935	1020	1105	1190
Four Lane Roadway										
Passenger Cars, Pickup Trucks	300	360	420	480	540	600	660	720	780	840
Single Unit Trucks Over 10,000 lb GVW	375	450	525	600	675	750	825	900	975	1050
Multi-Unit Trucks	500	600	700	800	900	1000	1100	1200	1300	1400

Source: State of Colorado State Highway Access Code

The access code also recognizes that site distances change when topography is not level as vehicle stopping distance is increased when going downhill and decreased going uphill. Section 4.3 (a) states “Table 4-2 shall be used to establish the minimum sight distance necessary for the entering vehicle. These lengths shall be adjusted for any grade of three percent or greater using table 4-4.”

Table 4 - 4: Stopping and Deceleration Adjustment Factors for Highway Grade

3% to 4.9% Upgrade, Use 0.9	3% to 4.9% Downgrade, Use 1.2
5% to 7% Upgrade, Use 0.8	5% to 7% Downgrade, Use 1.35

Boulder County developed a map to look at the elevation difference between the proposed intersection and 600 feet to the north, measured on the centerline. The elevation change is 25' (5478' – 5453') which over 600' is a grade is 4.2%, triggering an adjustment factor of 1.2.



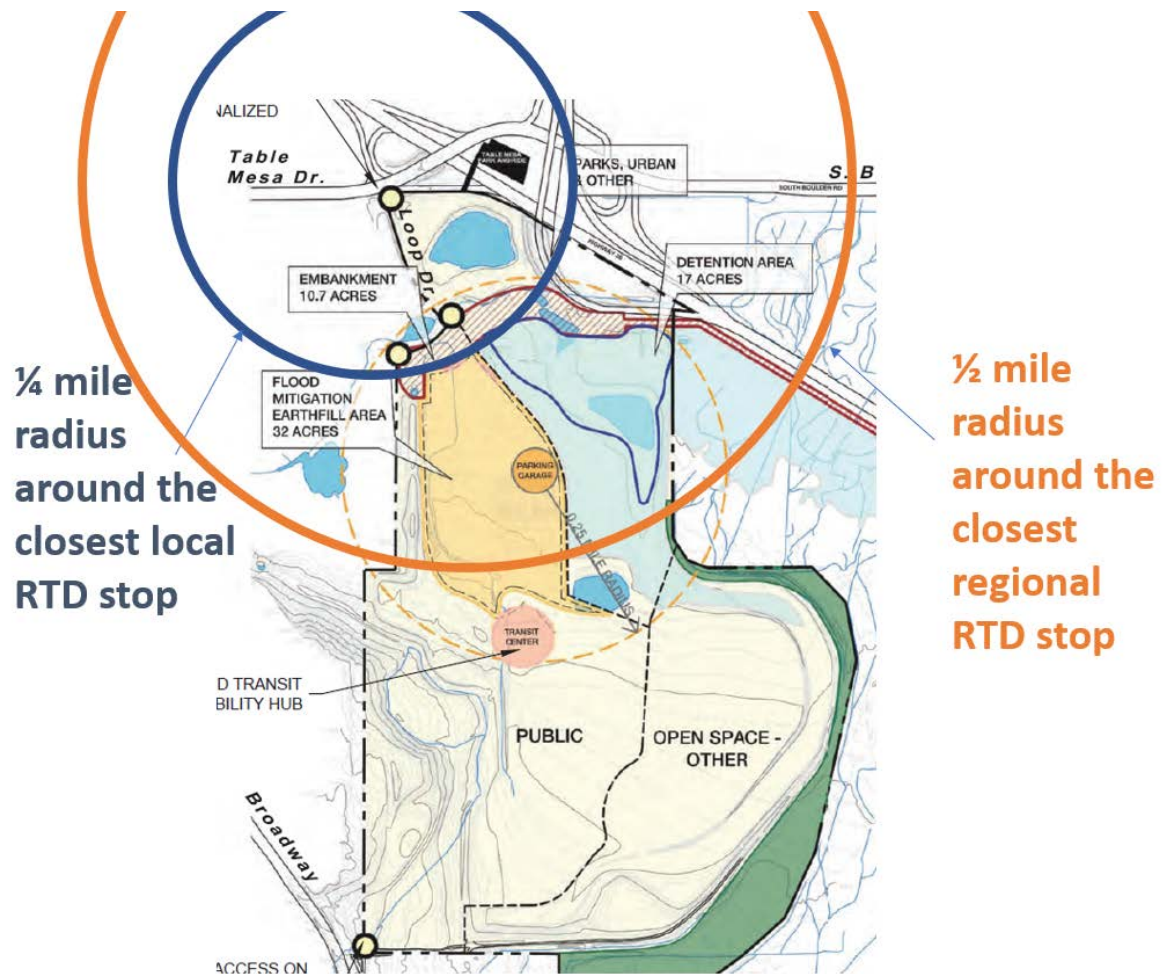
Thus, according to CDOT's access code the required visibility to the north of the proposed intersection should be 1,200 feet ($1000' \times 1.2$). This is about 200 feet north of the Chambers/Broadway intersection. Actual field checks should be conducted but by looking at the Google Earth photos it appears unlikely that this condition is met. Note that the Google photos are taken from the perspective several feet above the top of a car where as the access codes states the visibility should be measured at a height of 4.25 feet above the road.



Source: Google

Access to RTD Transit

The analysis used a 25% trip reduction from the ITE standard generation rates due “...to account for site access by transit, bicycle and pedestrian. This type of trip reduction is consistent with normal multimodal trip reductions taken in Boulder...” Unfortunately, this site is not a normal location for development in Boulder but is rather on the southern edge of the City. Almost the entire development will be outside of a ¼ mile to the nearest RTD stop – the distance most often used to measure reasonable access to transit. According to the recently released [Boulder Transportation Report on Progress](#): “Data shows that 87% of Boulder residents live within a 1/4 mile of a local or regional transit stop.” (Page 13) As can be seen from the figure below, almost none of the site is located within ¼ of mile of transit. It is very likely the 25% trip reduction used for other parts of the City is too high for this site.



It will be extremely important that the new bus system compensate for the inaccessibility of the RTD system. This would include not only new shuttles that go to the other campuses in Boulder, but also to high trip attraction locations such as the Table Mesa shopping center, Downtown and 29th Street Mall. While some of these locations around the City can be accomplished with the same route, not all primary destinations could be served by a single bus route; the routes would become too circuitous and travel times would be too long to attract riders. A more detailed transit demand study is needed to understand routings but at a minimum two bus routes are likely needed – one generally serving Table Mesa Shopping area, Main Campus and Downtown (West Route) and one serving the 28th/30th Street retail districts and East Campus (East Route).

The Traffic Impact Study anticipated that the CU Bus service would be “10-minute service for 15 hours a day.” (Page 18) Note that from the user’s perspective, each route must have a 10-minute frequency, not a 10-minute frequency of all the routes combined. In other words, with a 2-route system, a bus must leave CU South every 5 minutes alternating between the two routes to give each route a 10-minute frequency.

Trip Generation

The study justifies the trip reduction rates quantified in Table 3 stating that “...the net trip rates developed for the residential component of CU Boulder South approximate actual trip rates observed during previous studies at other similar CU residential housing in Boulder that serves married students, graduate students and/or faculty.” (Page 19) Presumably this is the Smiley Court Housing Development near Colorado & 30th and Newton Court on Arapahoe & Folsom. These two

existing housing locations are located steps away from the CU main campus and adjacent to the BOUND and JUMP routes, respectively. These urban environments are not analogous to the new housing locations in CU South and this will not have comparable mode splits and or vehicle trip generation rates. This underscores the above assertion that the 25% trip reduction is likely too high. Also, Table 3 should include addition trips that associated with new playing fields that will be built. This is likely ITE Trip Generation Rate number 488.

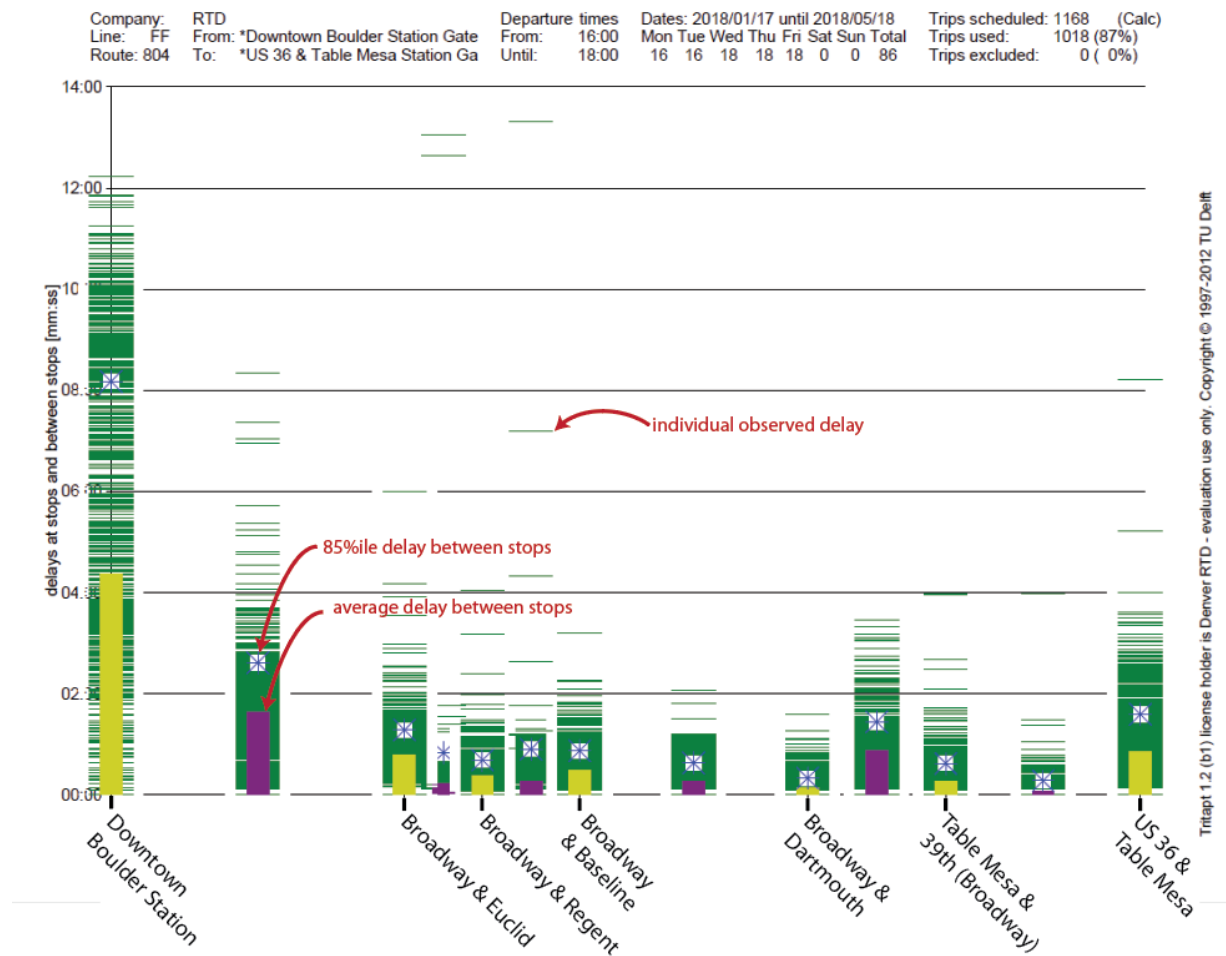
Transit Priority: SB LT at Broadway & Table Mesa

The Study recommends extending the existing southbound left turn lane on Broadway at Table Mesa by 390 feet (to achieve a 550 foot left turn lane) to avoid left turn vehicles from blocking the through lanes. This proposal will not achieve the City's goals of increasing transit mode splits, particularly for regional trips. The DASH to Louisville/ Lafayette, the AB to the airport and the FF1, FF2 and FF5 to US36 destinations and Denver all use this left turn. The photo below is taken looking south just south of Dartmouth & Broadway and shows four buses stuck in PM peak hour traffic. The graphic below shows that the section between Broadway & Dartmouth and Table Mesa & 39th is one of the highest delay points in the whole Broadway/Table Mesa corridor. In fact, 85% of transit trips are delayed about 1 ½ minutes in this section.



Source: Boulder County

Transit Delays on the Broadway Corridor: Downtown Boulder Station to US 36 & Table Mesa in the PM peak



Source: RTD

Capital improvements are needed that provide transit users with a distinct travel time savings over a private car. Below is an example of how this could be achieved. Not only would this help the existing RTD routes, it would also help the proposed new CU-operated bus routes. This may be the best opportunity the City has for a developer to help pay for these improvements.



Bicycle/Pedestrian Issues on CO93

As mentioned above, it appears that the proposed intersection on CO93 does not meet the requirements of the State of Colorado State Highway Access Code. That said, there may be a series of mitigation efforts that make the proposed intersection plausible. Under such a situation, we recommend that a multiuse underpass be constructed immediately east of CO93 under the new vehicle lanes. The existing multiuse path is heavily used and is a gateway for pedestrians and cyclists to access popular cycling routes including Marshall Road, Eldorado Springs Drive, CO170 (to Superior) and Cherryvale Road. It is also the access route for hikers and mountain bikers accessing the Marshall Mesa/Dowdy Draw trail system without a car. Given the grade at this point, cyclists can easily reach 20 mph going downhill leading to serious safety concerns should a new intersection be developed. Egressing drivers focusing on vehicle gaps on the four-lane CO93 could easily miss downhill cyclists. Grade separation for the cyclist and pedestrians will be necessary and should be included in any proposed intersection design.

Questions

How did the study arrive at only a 10% trip distribution for “West on Table Mesa Drive via S. Loop Drive to Broadway?” This seems low given that this would be the primary route to CU Main Campus, the Hill and Downtown Boulder. It is also the route taken to access the closest grocery stores, restaurants, retail and commercial service (Table Mesa Shopping Center). It would be helpful if more information could be provided about the trip distribution assumptions. Related, this distribution will likely need to be adjusted given the issues with connecting to CO93, as identified above.

Where else does the City have a 550-foot LT lane as proposed for the SB LT on Broadway at Table Mesa? Is it possible to have 500’ of vehicle queuing and still be LOS E?

Why not use Tantra Drive as an ingress and egress? Foreseeably existing residents may oppose this but that would distribute the traffic between two existing signalized intersections on Table Mesa and make more effective use of the existing street network. The Summit Middle School is accessed via Hanover, so there does not appear to be any conflicts there.

What efforts are being made to prioritize transit vehicles at any of the intersections adjacent to the development?

With 1 parking space per housing unit and 1 parking space per 600 square feet of office, there will be approximately 1,900 new parking spaces for the development. Has an analysis been done that roughly correlates that amount of parking with the trip generation estimates?

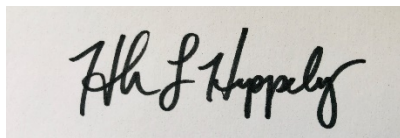
FLOODPLAIN

The City intends to apply for FDPs for the flood control project after annexation. Therefore, the County will not need to issue FDPs for the flood mitigation work. However, the County will review the floodplain mapping changes through the CLOMR and LOMR process.

City and county staff agree that the current regulatory hydraulic model for South Boulder Creek is difficult to use / modify. We understand that the city is currently developing alternative models for the project area and that the county will have an opportunity to comment on any change to the regulatory model. Our hope is that the new model will include all of South Boulder Creek downstream of Eldorado Springs, but that it will maintain (i.e. not increase) the current flood zones upstream of the project area.

Groundwater monitoring in the floodplain is ongoing and was previously permitted under the county's General FDP.

Sincerely,

A handwritten signature in black ink, appearing to read "Hannah Hippely", is centered within a light gray rectangular box.

Hannah Hippely, AICP
Long Range Planning Manager