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MEMORANDUM

July 3, 2020

To: Dan Blevins, Dave Gula
Organization: WILMAPCO
From: Christina Fink, P.E., Emily Koehle, P.E., Toole Design
Project: Concord Pike (US 202) Corridor Master Plan

Re: Traffic Analysis Approach and Results

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1. Introduction

The Concord Pike (US 202) Corridor Master Plan was undertaken to envision future land use and transportation development opportunities along Concord Pike. The Master Plan Final Report documents the plan recommendations to provide cohesive land use and transportation strategies to ensure that Concord Pike will continue to be a safe, accessible, and economically thriving place for all. One step in the process for developing the recommendations for transportation strategies was a detailed traffic analysis. The purpose of this memo is to document the approach and results of the detailed traffic analysis.

1.1. Vision for the Corridor & Our Approach

As documented in the Concord Pike Master Plan Final Report, today Concord Pike is primarily designed for vehicular traffic and is not inclusive of pedestrians, bicyclists, or transit riders. Consisting of a mostly six-lane street section, the corridor acts as a barrier disconnecting the east and west sides. Basic facilities, such as continuous sidewalks, crosswalks, and planting zones are not present. The streetscape is fragmented by numerous curb cuts, making Concord Pike a hostile environment for pedestrians.

Community engagement for the Concord Pike (US 202) Corridor Master Plan was conducted to identify and prioritize the community needs. Community engagement activities included public meetings and online outreach. Through these engagement activities, the project team developed a vision for the corridor. This vision includes the following elements:

- Create more walkable environments, both in between the businesses on Concord Pike and to/within surrounding neighborhoods;
- Establish strategies to reduce speeding and relieve heavy traffic; and
- Incorporate additional pedestrian and bicycle trails and crossings.

In accordance with this vision, the traffic analysis was conducted with a multimodal approach including walking, taking the bus, biking, and driving. Based on the vision for the corridor the traffic analysis was conducted with the understanding that the capacity or value of a street is more than the number of cars – it can also encourage pedestrian activity, enhance connections to surrounding land uses, and support economic vitality

1.2. Multimodal Approach

The team used a multimodal approach for the transportation elements in the Master Plan and the traffic analysis, summarized in this memorandum, which informs the final recommendations contained in the Master Plan Final Report. The analysis and recommendations considered each mode individually and considered the impacts and interaction between each mode. A summary of the considerations for each mode are described below.

- **Walking -** The recommendations in the Master Plan Final Report seek to create more walkable environments, both in between developments on Concord Pike as well as connecting to and within the surrounding neighborhoods. Additional roadway connections with sidewalks and shared use paths will enable walking and bicycling for transportation and recreation. At signalized intersections, creating pedestrian-friendly right-turn slip lanes and installing high-visibility crosswalks will improve crossings and slow turning vehicles. Adjustments at intersections, such as leading pedestrian intervals and right-turn on red restrictions, will also improve the safety and visibility of people crossing Concord Pike on foot. Details of these, as well as other identified pedestrian treatments, are provided in a Pedestrian Toolkit in the Master Plan Final Report.
- **Biking -** For those biking, additional roadway connections and comfortable bicycle facilities will improve connectivity, comfort, and safety. The proposed bicycle facilities in the study area include bike lanes, shared use paths, and bicycle boulevards to encourage bicycle activity and commuting by bike. Details of these bicycle facilities and treatments are provided in the Bicycle Toolkit in the Master Plan Final Report. In addition, DelDOT has conducted a statewide bicycle Level of Traffic Stress (LTS) Analysis to visualize gaps within Delaware's non-motorized transportation network. As in many other places, the low-stress network around Concord Pike is highly disconnected, with many "islands" of low-stress streets separated from one another by high-stress roadways and intersections that most people are unwilling to navigate by bicycle. Although the major intersections along Concord Pike are signalized, they still create barriers due to their size and lack of dedicated bicycle infrastructure.
- **Taking the bus -** The Concord Pike transit network is centered on commuting trips and consists of several bus routes and four Park & Ride locations. One of the bus routes has some of the highest ridership numbers of any route in the DART system. On the other hand, the Park & Ride locations are generally underutilized. DART has recently implemented service changes, increasing the frequency of Route 2 along Concord Pike and has plans for new stops as well as merging select routes along Concord Pike.
- **Driving -** The traffic analysis was used to answer three primary questions about motor vehicle operations on Concord Pike, looking ahead 30 years. These include:
    1. How will intersections along the corridor operate for motor vehicles with development…
        - … consistent with existing zoning (by-right)?
        - … proposed zoning (lower level of development)?
        - … proposed zoning (higher level of development)?
    2. How will the addition of roadway connections and ped/bike connections reduce delay for motor vehicles?
    3. How can we improve intersections to provide access for all users, whether they are walking, taking the bus, biking, or driving?

2. Motor Vehicle Analysis Approach

The motor vehicle traffic analysis was conducted with the goal of answering the three questions listed above. Concord Pike is a Delaware State Highway, located in New Castle County (NCC), within the Wilmington Area Planning Council (WILMAPCO) planning area. The traffic analysis was carried out with close coordination with staff from the Delaware Department of Transportation (DelDOT), NCC, and WILMAPCO.

The performance of the study intersections for motor vehicles was analyzed in Synchro 10.0. Performance was measured using Levels of Service (LOS), which is based on the process in the Highway Capacity Manual 6th Edition (HCM6). The HCM6 methodology is not capable of calculating the LOS for intersections with non-standard signal phasing. The default Synchro methodology was used when HCM6 was unavailable.

Definition of Performance Measures

Delay – Delay is the amount of time, in seconds, that it takes a vehicle passing through an intersection beyond what would be experienced in a free-flow condition. The value given is the average for all vehicles in a lane group.

Level of Services (LOS) – LOS are letter grades assigned to various degrees of delay. An LOS of "A" corresponds with free-, or near free-flowing conditions, while an "F" score corresponds with a breakdown in traffic flow. The goal in traffic operations is not to achieve an LOS of A, but to create conditions that maintain stable traffic flow which typically is achieved within the LOS range of A to D. According to the New Castle County Code of Ordinances Chapter 40, Article 11, Section 40.11.210, Level of Service A through D is considered acceptable.

If existing conditions are LOS E or F the aim should be to maintain conditions within that letter grade.

Levels of Service for signalized intersections is based on control delay using the criteria shown in Table 1. These thresholds are from the Transportation Research Board's Highway Capacity Manual.

Table 1: Relationship of LOS to control delay for signalized intersections

Level of Service	Control Delay (seconds)
A	0 to 10
B	> 10 to 20
C	> 20 to 35
D	> 35 to 55
E	> 55 to 80
F	> 80

2.1. Study Area Description

The following intersections, also shown in Figure 1, were evaluated in the Concord Pike traffic analysis. These study intersections include all signalized intersections along the corridor study area.

1. US 202 & Brandywine Pkwy
2. US 202 & Chubb Ent
3. US 202 & SR 92 Naamans Rd
4. US 202 & Concord Mall North
5. US 202 & Concord Mall South
6. US 202 & Rocky Run Pkwy/Widener U
7. US 202 & Righter Pkwy/Concord Square
8. US 202 SB & NB U-turn
9. US 202 NB & Silverside Rd
   91. US 202 SB & Garden of Eden Rd
10. US 202 NB & Brandywine Blvd
    101. US 202 SB & Brandywine Blvd
11. US 202 NB & Mt Lebanon Rd
    111. US 202 SB & Mt Lebanon Rd
12. US 202 & Prospect Ave
13. US 202 & Whitby Rd/Florence Ave
14. US 202 & Concord Ave
15. US 202 & Woodrow Ave
16. US 202 & Sharpley Rd
17. US 202 & Fairfax Blvd
18. US 202 & AZ Ent/Fairfax Shopping Ctr
19. US 202 & Powder Mill Rd/Murphy Rd
20. US 202 & Independence Mall
21. US 202 & Foulk Rd
22. US 202 & Augustine Cutoff

Study Intersections

Concord Pike (US 202)

11/27/18

0 700 1,400 2,800 Feet

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Figure 1: Study Intersections Map

2.2. Land Use + Transportation Scenarios

In order to answer the three motor vehicle analysis questions listed above, a combination of various land use and transportation scenarios were studied. Each land use scenario was analyzed with multiple transportation scenarios. These scenarios are described below.

2.2.1. 2019 Existing Conditions

The 2019 Existing Conditions Synchro traffic analysis files were provided by DelDOT and verified by Toole Design. These files contain existing laneage, traffic signal timings, and traffic volumes collected between 2012 and 2019. Any volumes collected prior to 2019 were grown at 0.5% per year to approximate 2019 volumes. The traffic volumes were also adjusted at select locations where the volumes between two adjacent intersections were very off balance. The 2019 Existing Conditions traffic models were used to develop the future conditions models.

2.2.2. 2050 Baseline

All future scenarios included in the traffic analysis were evaluated for the year 2050. The 2050 Baseline scenario includes the same laneage and signal timings as the existing conditions. The traffic volumes were increased by a total of 13%, or 0.4% per year, for the northbound and southbound through movements on Concord Pike to account for regional traffic growth. This growth rate was developed based on historic growth on the corridor. The 2050 Baseline scenario served as a point of comparison for all future scenarios.

2.2.3. Land Use Scenarios

The Concord Pike Master Plan studied changes to zoning to accomplish project goals and the traffic analysis evaluated three difference land use scenarios. The land use scenarios include current development, either under construction or approved, and possible development with either current zoning or proposed zoning at specific development sites along the corridor. The proposed zoning aligns with the County's population consortium projections. All development parcels, with the section of 9e (Columbia Place at Garden of Eden Road, a 55+ community), are within a proposed Target Redevelopment Area (TRA). The TRA promotes mixed-use development, pedestrian-friendly/multi-modal streets, and on-site surface parking or structured parking that is screened. The development sites are listed below and shown in Figure 2.

- 4 – Avenue North
- 5a – Fairfax Commercial
- 5b – Fairfax Multi-Family
- 7 – Former Charles Bush School
- 8 – Brandywine Op. & Mt Lebanon Park
- 9e – Columbia Place at Garden of Eden Road
- 11 – Chuck-e-Cheese
- 12 – Concord Plaza
- 16a – Restaurant Row (west of 202)
- 16b – Widener University (east of 202)
- 23 – Brandywine Town Center

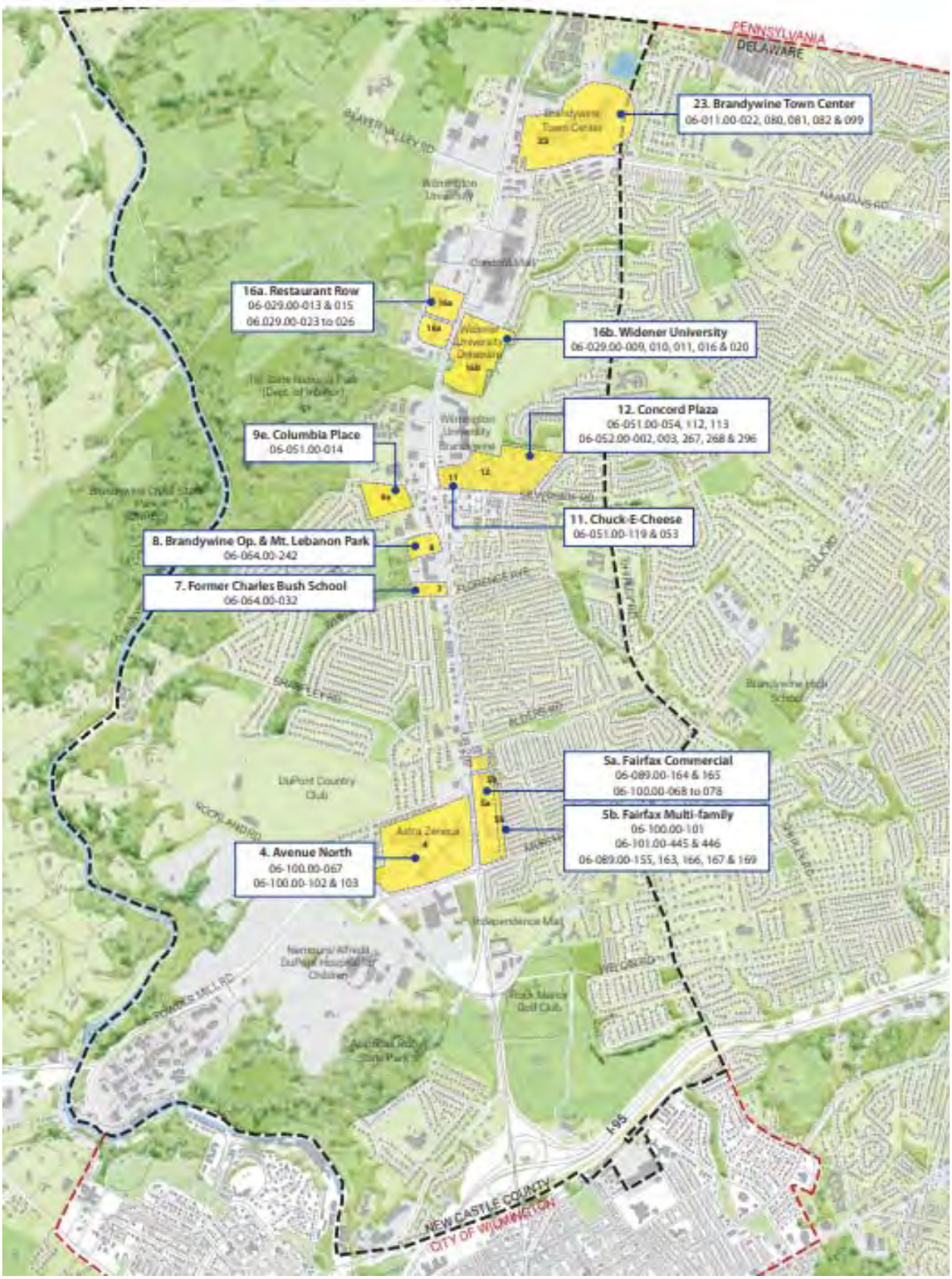

Figure 2: Development Parcel Map

Three future land use scenarios were evaluated as part the traffic analysis. One scenario is “By-Right Development” which using current zoning and scenarios use “Proposed Zoning” with either a lower or higher level of development intensity. The land use scenarios are described in the table below. The land use scenarios, combined with the transportation scenarios described in the following section, will result in different numbers of people on and adjacent to the corridor coming to or from the development sites. Additional details the development of land uses scenarios can be found in the Master Plan Final Report.

Table 2: Future Land Use Scenarios

By-Right Development Parcels are developed consistent with existing zoning.		This scenario represents development that could occur with no changes to the existing zoning.
Proposed Zoning Parcels are developed based on proposed zoning.	**Low**	Less development is realized.
	High	Higher level of development occurs.

The development details associated with each of these land use scenarios are given in Tables 3-4. The Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition was used to calculate the number of trips generated from each development site for each land use scenario.

Table 3: Future Land Use and Development Details – By-Right Development

Subareas	Existing		Demo					Proposed / Approved					Net New				
Location	#	Description	Retail (SF)	Residential (DU)	Hotel (Keys)	Civic/ Institutional (SF)	Office (SF)	Retail (SF)	Residential (DU)	Hotel (Keys)	Civic/ Institutional (SF)	Office (SF)	Retail (SF)	Residential (DU)	Hotel (Keys)	Civic/ Institutional (SF)	Office (SF)
Sub-Area 2 (Between Silverside Rd & Murphy Rd)	4	Avenue North	-	-	-	-	-	200,000	335	360	-	-	200,000	335	360	-	-
	5a	Fairfax Commercial	214,659	-	127	-	-	90,215	160	-	-	90,215	(124,444)	160	(127)	-	90,215
	5b	Fairfax Multi-Family	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	Former Charles Bush School	-	-	-	-	-	28,400	-	-	-	56,800	28,400	-	-	-	56,800
	8	Brandywine Op. & Mt Lebanon Park	-	-	-	12,120	-	23,580	-	-	-	47,160	23,580	-	-	(12,120)	47,160
	9e	Columbia Place at Garden of Eden Road	-	-	-	-	-	-	150	-	-	-	-	-	-	-	-
SUBTOTAL			**214,659**	**-**	**127**	**12,120**	**-**	**342,195**	**495**	**360**	**-**	**194,174**	**127,536**	**495**	**233**	**(12,120)**	**194,174**
Sub-Area 3 (Between Beaver Valley Rd/ Naamans Rd & Silverside Rd)	11	Chuck-e-Cheese	74,417	-	-	-	-	74,825	133		-	74,825	408	133	-	-	74,825
	12	Concord Plaza	-	-	-	-	225,927	40,000	340		-	60,000	40,000	340	-	-	(165,927)
	16a	Restaurant Row	-	-	-	-	-	32,000	-	220	-	-	32,000	-	220	-	-
	16b	Widener University	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL			**74,417**	**-**	**-**	**-**	**225,927**	**146,825**	**473**	**220**	**-**	**134,825**	**72,408**	**473**	**220**	**-**	**(91,102)**
Sub-Area 4 (North of Beaver Valley Rd/ Naamans Rd)	23	Brandywine Town Center	349,462	-	-	7,631	-	431,793	704	150	-	431,793	82,331	704	150	(7,631)	431,793
SUBTOTAL			**349,462**	**-**	**-**	**7,631**	**-**	**431,793**	**704**	**150**	**-**	**431,793**	**82,331**	**704**	**150**	**(7,631)**	**431,793**
SUM TOTAL			**638,538**	**-**	**127**	**19,751**	**225,927**	**920,813**	**1,672**	**730**	**-**	**760,793**	**282,275**	**1,672**	**603**	**(19,751)**	**534,866**

Table 4: Future Land Use and Development Details – Proposed Zoning – Low

Subareas	Existing		Demo					Proposed / Approved					Net New				
Location	#	Description	Retail (SF)	Residential (DU)	Hotel (Keys)	Civic/ Institutional (SF)	Office (SF)	Retail (SF)	Residential (DU)	Hotel (Keys)	Civic/ Institutional (SF)	Office (SF)	Retail (SF)	Residential (DU)	Hotel (Keys)	Civic/ Institutional (SF)	Office (SF)
Sub-Area 2 (Between Silverside Rd & Murphy Rd)	4	Avenue North	-	-	-	-	-	200,000	335	360	-	-	200,000	335	360	-	-
	5a	Fairfax Commercial	214,659	-	127	-	-	103,100	321	-	-	51,550	(111,559)	321	(127)	-	51,550
	5b	Fairfax Multi-Family	-	-	-	-	-	-	43	-	-	-	-	43	-	-	-
	7	Former Charles Bush School	-	-	-	-	-	12,175	97	-	-	-	12,175	97	-	-	-
	8	Brandywine Op. & Mt Lebanon Park	-	-	-	12,120	-	25,260	-	-	25,260	50,520	25,260	-	-	13,140	50,520
	9e	Columbia Place at Garden of Eden Road	-	-	-	-	-	-	150	-	-	-	-	150	-	-	-
SUBTOTAL			**214,659**	**-**	**127**	**12,120**	**-**	**340,535**	**946**	**360**	**25,260**	**102,070**	**125,876**	**946**	**233**	**13,140**	**102,070**
Sub-Area 3 (Between Beaver Valley Rd/ Naamans Rd & Silverside Rd)	11	Chuck-e-Cheese	74,417	-	-	-	-	59,850	186	-	-	29,925	(14,567)	186	-	-	29,925
	12	Concord Plaza	-	-	-	-	225,927	40,000	340		-	60,000	40,000	340	-	-	(165,927)
	16a	Restaurant Row	-	-	-	-	-	32,000	450	220	-	-	32,000	450	220	-	-
	16b	Widener University	-	-	-	-	136,506	32,590	252	150	-	30,265	32,590	252	150	-	(106,241)
SUBTOTAL			**74,417**	**-**	**-**	**-**	**362,433**	**164,440**	**1,228**	**370**	**-**	**120,189**	**90,023**	**1,228**	**370**	**-**	**(242,244)**
Sub-Area 4 (North of Beaver Valley Rd/ Naamans Rd)	23	Brandywine Town Center	349,462	-	-	7,631	-	337,940	1,079	150	-	109,000	(11,522)	1,079	150	(7,631)	109,000
SUBTOTAL			**349,462**	**-**	**-**	**7,631**	**-**	**337,940**	**1,079**	**150**	**-**	**109,000**	**(11,522)**	**1,079**	**150**	**(7,631)**	**109,000**
SUM TOTAL			**638,538**	**-**	**127**	**19,751**	**362,433**	**842,915**	**3,252**	**880**	**25,260**	**331,260**	**204,377**	**3,252**	**753**	**5,509**	**(31,173)**

Table 5: Future Land Use and Development Details – Proposed Zoning – High

Subareas		Existing	Demo					Proposed / Approved					Net New				
Location	#	Description	Retail (SF)	Residential (DU)	Hotel (Keys)	Civic/ Institutional (SF)	Office (SF)	Retail (SF)	Residential (DU)	Hotel (Keys)	Civic/ Institutional (SF)	Office (SF)	Retail (SF)	Residential (DU)	Hotel (Keys)	Civic/ Institutional (SF)	Office (SF)
Sub-Area 2 (Between Silverside Rd & Murphy Rd)	4	Avenue North	-	-	-	-	-	200,000	335	360	-	-	200,000	335	360	-	-
	5a	Fairfax Commercial	214,659	-	127	-	-	154,660	481	-	-	77,330	(59,999)	481	(127)	-	77,330
	5b	Fairfax Multi-Family	-	-	-	-	-	-	71	-	-	-	-	71	-	-	-
	7	Former Charles Bush School	-	-	-	-	-	18,260	146	-	-	-	18,260	146	-	-	-
	8	Brandywine Op. & Mt Lebanon Park	-	-	-	12,120	-	37,895	-	-	37,895	75,790	37,895	-	-	25,775	75,790
	9e	Columbia Place at Garden of Eden Road	-	-	-	-	-	-	150	-	-	-	-	150	-	-	-
SUBTOTAL			**214,659**	**-**	**127**	**12,120**	**-**	**410,814**	**1,183**	**360**	**37,895**	**153,120**	**196,155**	**1,183**	**233**	**25,775**	**153,120**
Sub-Area 3 (Between Beaver Valley Rd/ Naamans Rd & Silverside Rd)	11	Chuck-e-Cheese	74,417	-	-	-	-	59,850	186	-	-	29,925	(14,567)	186	-	-	29,925
	12	Concord Plaza	-	-	-	-	225,927	40,000	340		-	60,000	40,000	340	-	-	(165,927)
	16a	Restaurant Row	94,046	-	-	-	-	72,000	650	220	-	-	(22,046)	650	220	-	-
	16b	Widener University	-	-	-	-	136,506	50,130	447	150	-	142,895	50,130	447	150	-	6,389
SUBTOTAL			**168,463**	**-**	**-**	**-**	**362,433**	**221,981**	**1,623**	**370**	**-**	**232,820**	**53,518**	**1,623**	**370**	**-**	**(129,613)**
Sub-Area 4 (North of Beaver Valley Rd/ Naamans Rd)	23	Brandywine Town Center	349,462	-	-	7,631	-	337,940	1,378	150	-	168,000	(11,522)	1,378	150	(7,631)	168,000
SUBTOTAL			**349,462**	**-**	**-**	**7,631**	**-**	**337,940**	**1,378**	**150**	**-**	**168,000**	**(11,522)**	**1,378**	**150**	**(7,631)**	**168,000**
SUM TOTAL			**732,584**	**-**	**127**	**19,751**	**362,433**	**970,736**	**4,184**	**880**	**37,895**	**553,940**	**238,152**	**4,184**	**753**	**18,144**	**191,507**

2.2.4. Transportation Scenarios

Four different transportation scenarios, each building upon the previous, were evaluated as part the traffic analysis. With changes to the transportation network, including the addition of new street connections within development areas and safer, more comfortable places for people to walk and bike, how people chose to travel through the study area will change over time. The transportation scenarios will result in different mode splits (i.e. percentages of people driving, walking, bike, taking the bus), and trip distributions (i.e. routes motorists use) onto the network coming to or from the development sites. The transportation scenarios are described below.

- **Do Nothing** – The Do Nothing transportation scenario evaluates the existing transportation infrastructure. Mode splits from the ITE Trip Generation Handbook, 3rd Edition were used to determine the number of vehicle, transit, and non-motorized trip generation based on current transportation context (e.g. network connectivity, pedestrian and bicycle infrastructure and transit service). These mode splits are given in Appendix A. Due to the mixed-use nature of the development in each land use, the trip generation accounted for internal capture. Internal trip capture is the portion of trips generated by a mixed-use development that both begin and end within the development. The number of external trips were reduced based on the proportion of residential, retail, office, hotel, and other land uses. Trip generation by parcel is given in Appendix B. Trips were assigned to the network based on trip distribution percentages provided by DelDOT. The trip assignment figures that show the total number of new trips for all development sites are provided in Appendix C. Traffic signal timings were modified to optimize operations in this scenario compared to the Baseline timing.
- **Enhanced Vehicle Network** – This scenario evaluates the changes due to additional vehicular network connections in the vicinity of Concord Pike. The additional network connections are shown in Figure 3. This enhanced vehicle network disperses motorists' trips by providing them to take a different route through the network, potentially avoiding a busier intersection. The mode splits from the ITE Trip Generation Handbook, 3rd Edition used in the Do Nothing scenario were used in the Enhanced Vehicle Network scenario. DelDOT provided values for trip assignment traffic shifts for background traffic and updated trip distributions for site trips. The trip assignment figures that show the total number of new trips for all development sites and shifts due to new vehicle network are provided in Appendix C. Traffic signal timings were modified to optimize operations in this scenario compared to the Baseline timing.
- **Enhanced Ped/Bike Network** – This scenario builds on the Enhanced Vehicle Network scenario and evaluates changes due to additional pedestrian and bicycle connections in the vicinity of Concord Pike, in addition to the additional vehicular network connections. The additional pedestrian and bicycle connections are shown in Figure 4. The enhanced pedestrian and bicycle connections will provide more opportunities for non-motorized travel, especially for short trips. Therefore, the mode splits were adjusted for office and residential land uses compared to the Do Nothing and Enhanced Vehicle Network scenarios to account for more non-motorized trips, based on the DelDOT Household Travel Survey, conversations with DelDOT staff and anticipated change in behavior over time along the corridor. The transit mode split was increased from 1% to 4% and the non-motorized mode split was increased to 9% for office and 20% and 26% for the AM and PM peaks, respectively, for residential. Additional details on the mode splits are given in Appendix A. Trip generation by parcel is given in Appendix B. Trip distribution percentages from the Enhanced Vehicle Network scenario were used. The trip assignment figures that show the total number of new trips for all development sites, shifts due to new vehicle network, and shifts due to enhanced ped/bike network are provided in Appendix C. Traffic signal timings were modified to optimize operations in this scenario compared to the Baseline timing.

Figure 3: Proposed Enhanced Vehicle Network

Concord Pike (US 202)

7/3/2020

0 550 1,100 2,200 Feet

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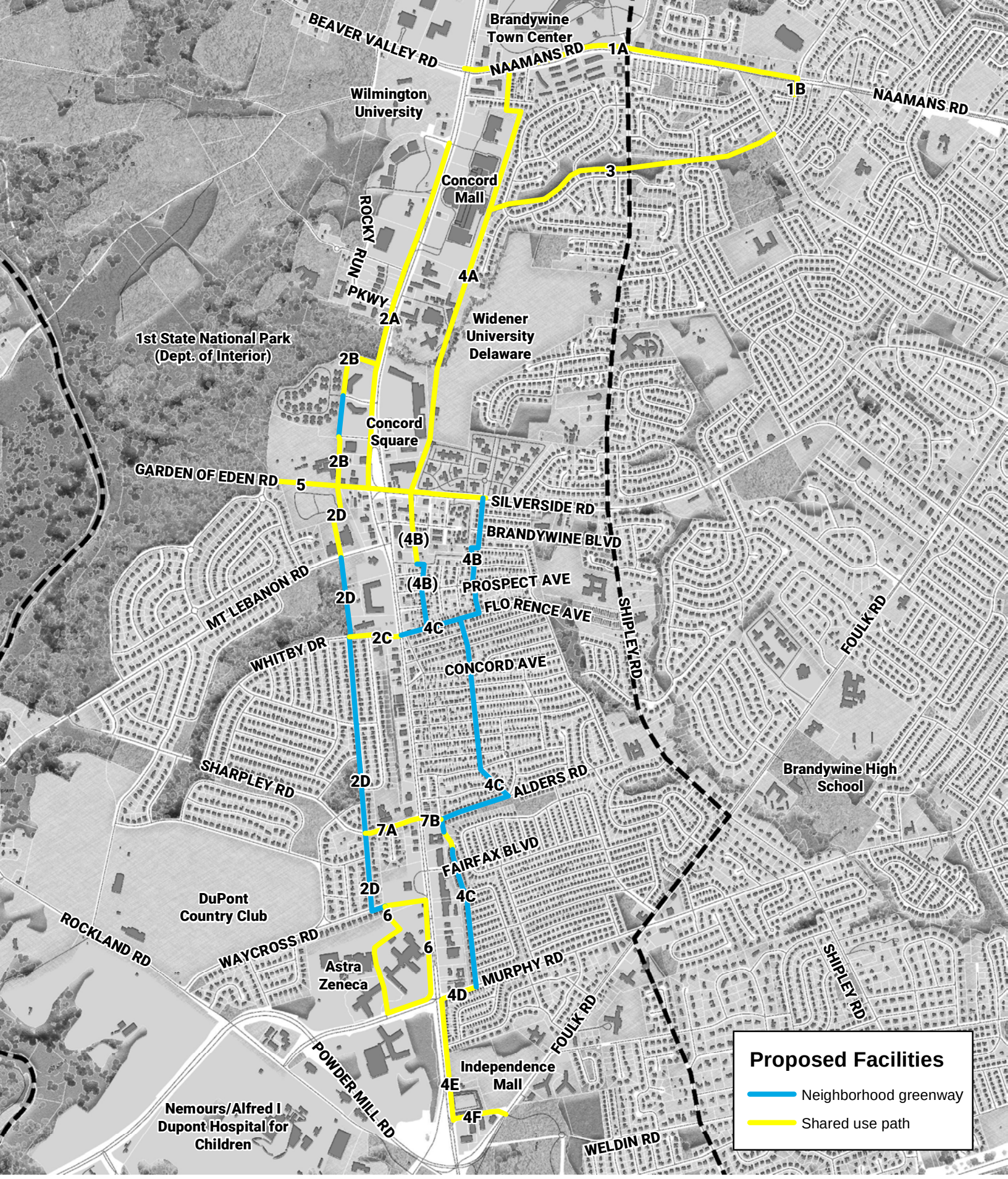

Figure 4: Proposed Enhanced Vehicle Network

Concord Pike (US 202)

7/3/2020

0 550 1,100 2,200 Feet

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- Multimodal Improvements – This scenario represents treatments that could be implemented at intersections along the corridor to improve conditions for walking and biking. The purpose of this scenario is to initiate a discussion regarding the changes to motor vehicle level of service compared to the improvements for non-motorized travel. Prior to conducting the analysis, it was known that the treatments included in the Multimodal Improvements scenario may increase delay for motorists. Despite this tradeoff for motorists, the treatments would provide many benefits to pedestrians including:
    - Reducing vehicle-pedestrian interactions,
    - Providing additional places for people to cross street,
    - Providing head start for pedestrians or fully separated crossing, and
    - Improving access to bus stops.

  The Enhanced Ped/Bike Network scenario, which also includes the connections from the Enhanced Vehicle Network, was used as a starting point for the mode splits and trip assignments in the Multimodal Improvements scenario. Specific multimodal improvements were tested at six intersections along Concord Pike. These intersections include:
    - SR 92 Naamans Road (Intersection #3)
    - Righter Pkwy/Concord Square (Intersection #7)
    - Silverside Road (Intersection #9 & 91)
    - Mount Lebanon Road (Intersection #11 & 111)
    - Whitby Road/Florence Avenue (Intersection #13)
    - Powder Mill Road/Murphy Road (Intersection #19)

  Treatments from the Pedestrian Toolkit were evaluated in the Synchro models. These treatments include both geometric and traffic signal treatments that are listed below. Not all treatments were evaluated at all intersections.
    - Geometric Treatments
        - Address right-turn conflicts
            - Remove channelized right-turns
            - Construct pedestrian-friendly right-turn slip lanes
        - Add crosswalks
    - Traffic Signal Treatments
        - Implement leading pedestrian intervals
        - Implement exclusive pedestrian signal phases
        - Restrict right-turn on red
        - Implement signal phasing and timing strategies (overlaps, turn phases, etc.)

2.2.5. Combination of Transportation and Land Use Scenarios

Each land use scenario will result in a different number of person trips on Concord Pike. The land use scenarios were combined with transportation scenarios to determine how intersections would function for motorists with the combined scenarios. Figure 5 and Table 5 shows how the land use scenarios and transportation scenarios were combined in the analysis.

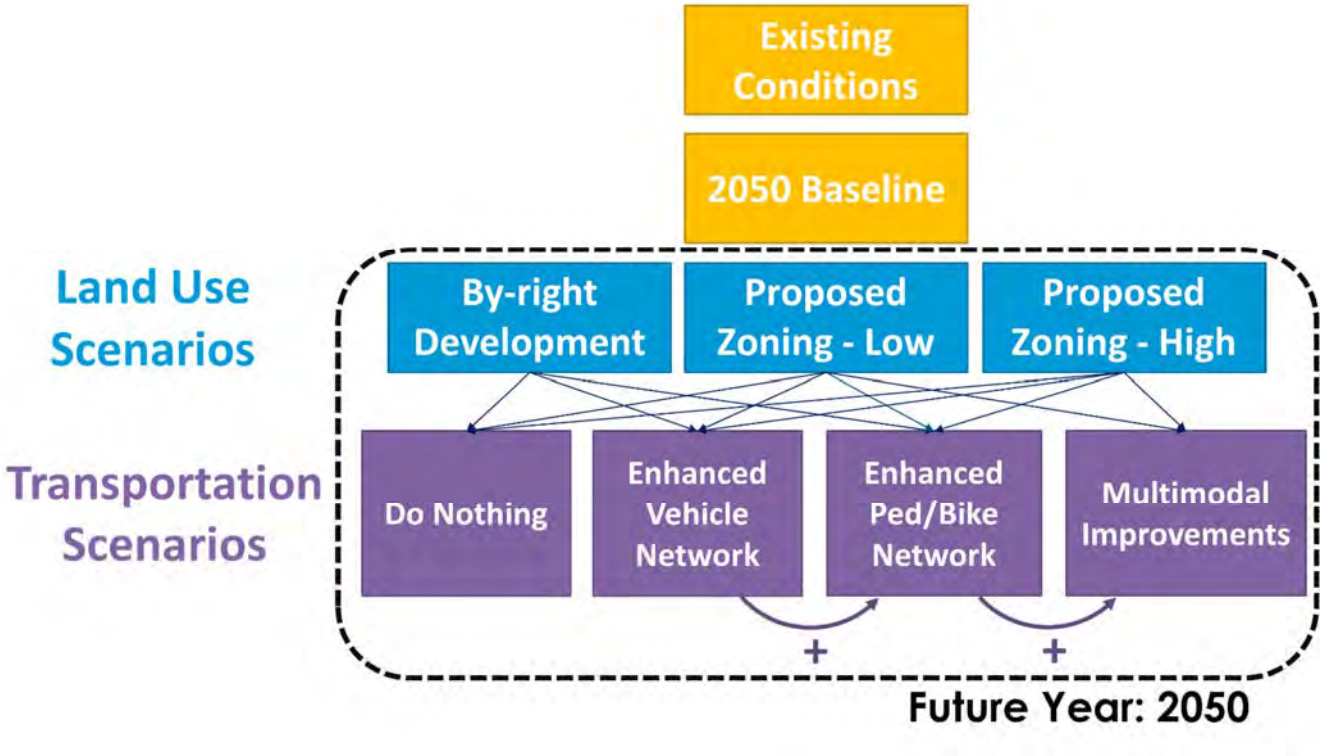

Figure 5: Land Use and Transportation Scenario Summary

Table 6: Land Use and Transportation Scenario Summary

	Do Nothing	*Enhanced Vehicle Network*	*Enhanced Vehicle Network + Enhanced Ped/Bike*	*Enhanced Vehicle Network + Enhanced Ped/Bike + Multimodal Improvements*
2019 Existing	x			
2050 Baseline	x			
2050 By-Right	x	x	x	
2050 Proposed Zoning – Low	x	x	x	x
2050 Proposed Zoning – High	x	x	x	x

2.3. Trip Generation and Trip Assignment

As noted in the Land Use Scenarios and Transportation Scenarios sections above, the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition was used to calculate the number of person trips generated for the combined land use and transportation scenarios. Mode splits were either determined from the ITE Trip Generation Handbook, 3rd Edition for the baseline mode split, or using the DelDOT Household Travel Survey for the enhanced ped/bike mode split. The overall trip generation details are given in Table 6, showing both person trips (or total trips whether driving, taking transit or non-motorized) and vehicle trips These vehicle trips were assigned to the network based on values provided by DelDOT using the existing vehicular network as well as the enhanced vehicle network. The trip assignment information is provided in Appendix C. The overall scenario volumes are given in Appendix D.

Table 7: Overall Trip Generation

Peak	Development Scenario	Mode split	Total Person Trips	Total Vehicle Trips	Entering		Exiting	
					Person Trips	Vehicle Trips	Person Trips	Vehicle Trips
AM	By-Right Development	Baseline mode split	1,867	1,703	1,029	940	838	762
		Enhanced ped/bike mode split	1,869	1,475	1,030	842	839	633
	Proposed Zoning – Low Development	Baseline mode split	1,959	1,771	715	640	1,244	1,131
		Enhanced ped/bike mode split	1,963	1,495	718	575	1,245	920
	Proposed Zoning – High Development	Baseline mode split	2,703	2,445	1,093	983	1,610	1,462
		Enhanced ped/bike mode split	2,708	2,054	1,096	872	1,612	1,183
PM	By-Right Development	Baseline mode split	2,858	2,177	1,324	978	1,534	1,199
		Enhanced ped/bike mode split	2,864	1,808	1,326	794	1,537	1,014
	Proposed Zoning – Low Development	Baseline mode split	2,834	2,210	1,616	1,273	1,218	937
		Enhanced ped/bike mode split	2,844	1,764	1,621	1,004	1,223	760
	Proposed Zoning – High Development	Baseline mode split	3,848	3,032	2,090	1,654	1,758	1,378
		Enhanced ped/bike mode split	3,862	2,413	2,097	1,293	1,765	1,121

The following key takeaways were taken from the overall trip generation.

- The total person trip and total vehicle trips are similar in the by-right development scenario and proposed zoning – low development scenario. Due to the different land uses in these two scenarios (more retail and office with the by-right development and more residential with the proposed zoning – low), the number of trips entering and exiting differ between these scenarios. In general, the additional office and retail development result in more entering trips in the AM and exiting trips in the PM, while the additional residential development in the proposed zoning results in more exiting trips in the AM and more entering trips in the PM.
- The proposed zoning – high development scenario results in approximately 37% more total person trips and total vehicle trips than the proposed zoning – low development scenario.
- On average, the enhanced ped/bike mode split maintains the number of total person trips compared to the baseline mode split but reduces the number of total vehicle trips from the new development by approximately 17%.

3. Results

As noted in the Multimodal Approach section of this memo, the traffic analysis was conducted with the goal of answering three questions about motor vehicle operations on Concord Pike while looking ahead 30 years. These include:

1. How will intersections along the corridor operate for motor vehicles with development…
    - … consistent with existing zoning (by-right)?
    - … proposed zoning (lower level of development)?
    - … proposed zoning (higher level of development)?
2. How will the addition of roadway connections and ped/bike connections reduce delay for motor vehicles?
3. How can we improve intersections to provide access for all users, whether they are walking, taking the bus, biking, or driving?

Through the results of the motor vehicle analysis, these questions can be answered. Table 7 shows a comparison of the number of intersections operating at LOS A-C, LOS D and LOS E-F in each of the scenarios. Figures 6-31 show maps for each scenario with the LOS at each intersection. Detailed LOS results are given in Appendix E.

Table 8: Number of Intersections Operating at Each LOS for Motor Vehicles

Scenario	*LOS*	*Do Nothing*	*Enhanced Vehicle Network*	*Enhanced Vehicle Network + Enhanced Ped/Bike*	*Enhanced Vehicle Network + Enhanced Ped/Bike + Multimodal Improvements*
2019 Existing	A-C	42	-	-	-
	D	7	-	-	-
	E-F	1	-	-	-
2050 Baseline	A-C	37	-	-	-
	D	8	-	-	-
	E-F	5	-	-	-
2050 By-Right	A-C	33	36	38	-
	D	8	6	4	-
	E-F	9	8	8	-
2050 Proposed Zoning – Low	A-C	34	36	37	31
	D	6	5	7	9
	E-F	10	9	6	8
2050 Proposed Zoning – High	A-C	28	31	33	29
	D	9	10	8	10
	E-F	13	9	8	9

The following key takeaways were taken from the motor vehicle traffic analysis results.

- Intersections operate similarly for motorists whether the area is redeveloped consistent with existing zoning (by-right scenario) or proposed zoning - low. While slight variations in the number of intersections operating at each LOS can be attributed to differences in trip generation between the peaks, overall these two land use scenarios would result in similar operations on the corridor.
- Without any improvements to the transportation network (i.e. the do nothing transportation scenario), more intersections would operate at LOS E or F with the proposed zoning – high development land use scenario compared to the proposed zoning-low scenario. With the transportation network enhanced through vehicle network and ped/bike network, the proposed zoning – high scenario operates more similarly to the lower development scenarios.
- Overall, adding enhanced network for vehicles results in more intersections operating at LOS A-C and fewer operating at LOS E or F compared to the do nothing transportation scenario. Adding enhanced network for peds/bikes results in more intersections operating at LOS A-C and fewer operating at LOS E or F compared to the enhanced vehicle network scenario.
- The addition of multimodal improvements would increase the number of intersections operating at LOS D-F but the benefits of these improvements were discussed previously in this memo and include reducing conflicts between modes.

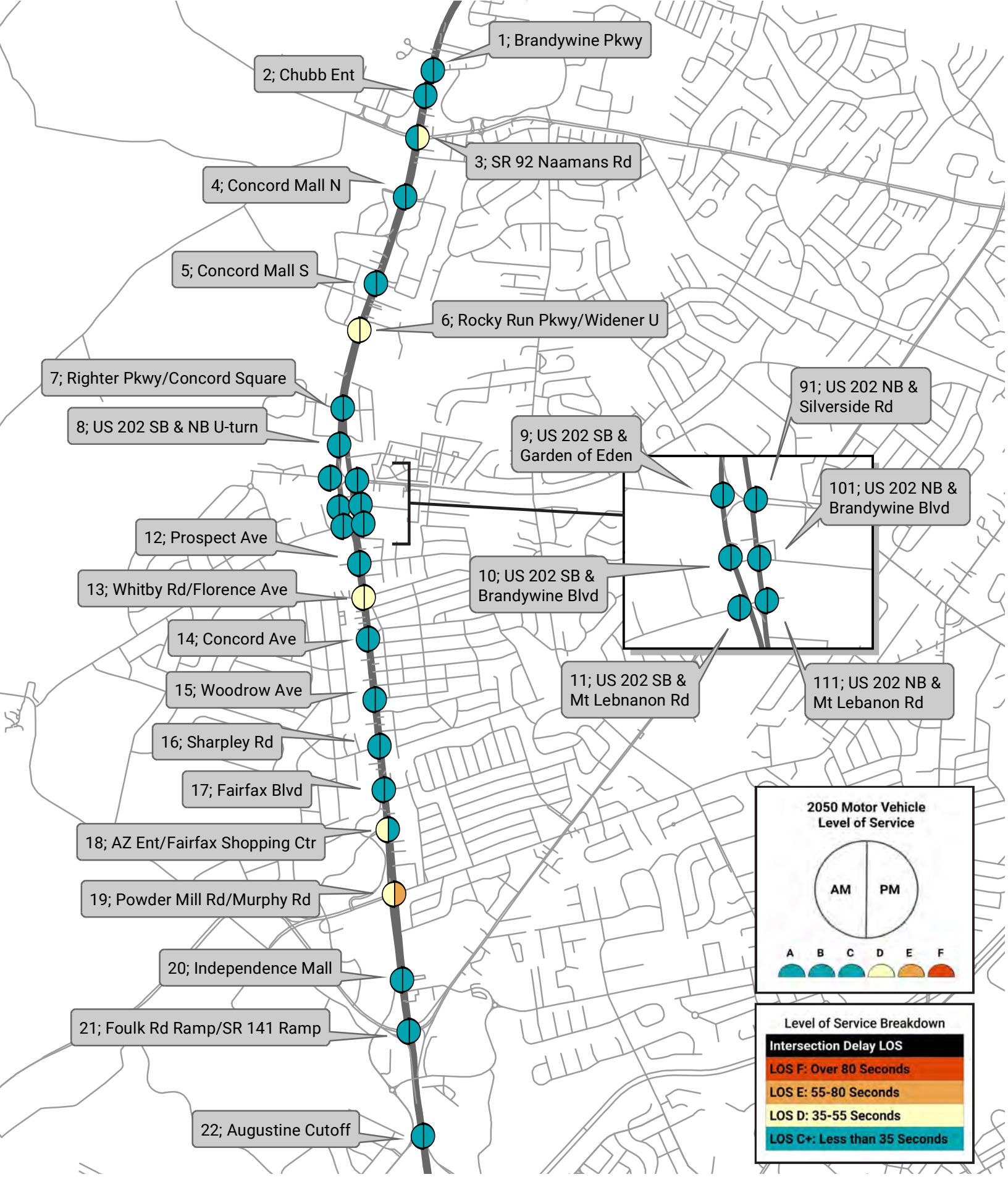

Figure 6: Existing Conditions

Concord Pike (US 202)

0 900 1,800 3,600 Feet

N

TOOLE DESIGN

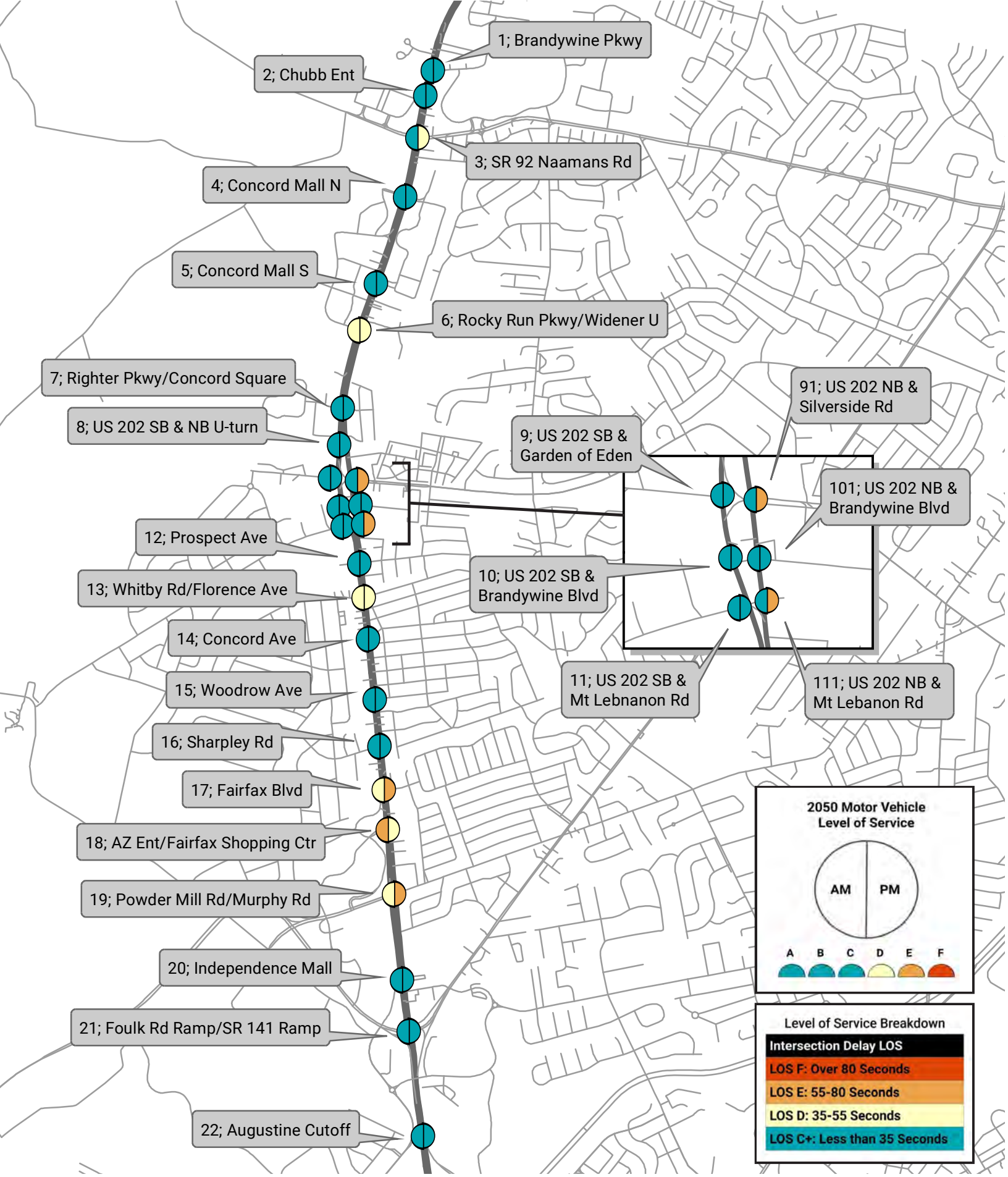

Figure 7: 2050 Baseline

Concord Pike (US 202)

0 900 1,800 3,600 Feet

N

TOOLE DESIGN

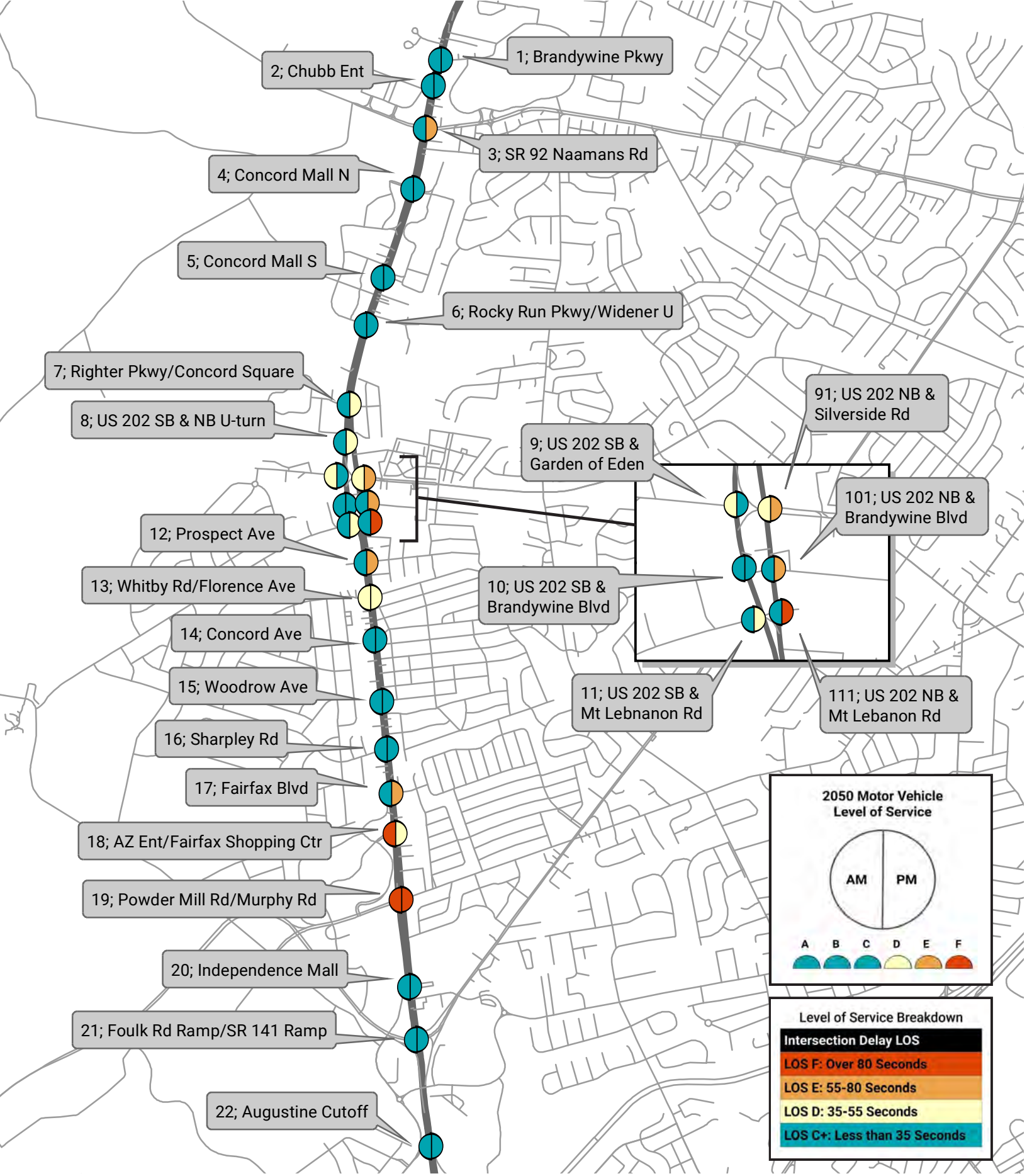

Figure 8: By-right Development

Do Nothing

Concord Pike (US 202)

0 900 1,800 3,600 Feet

N

TOOLE DESIGN

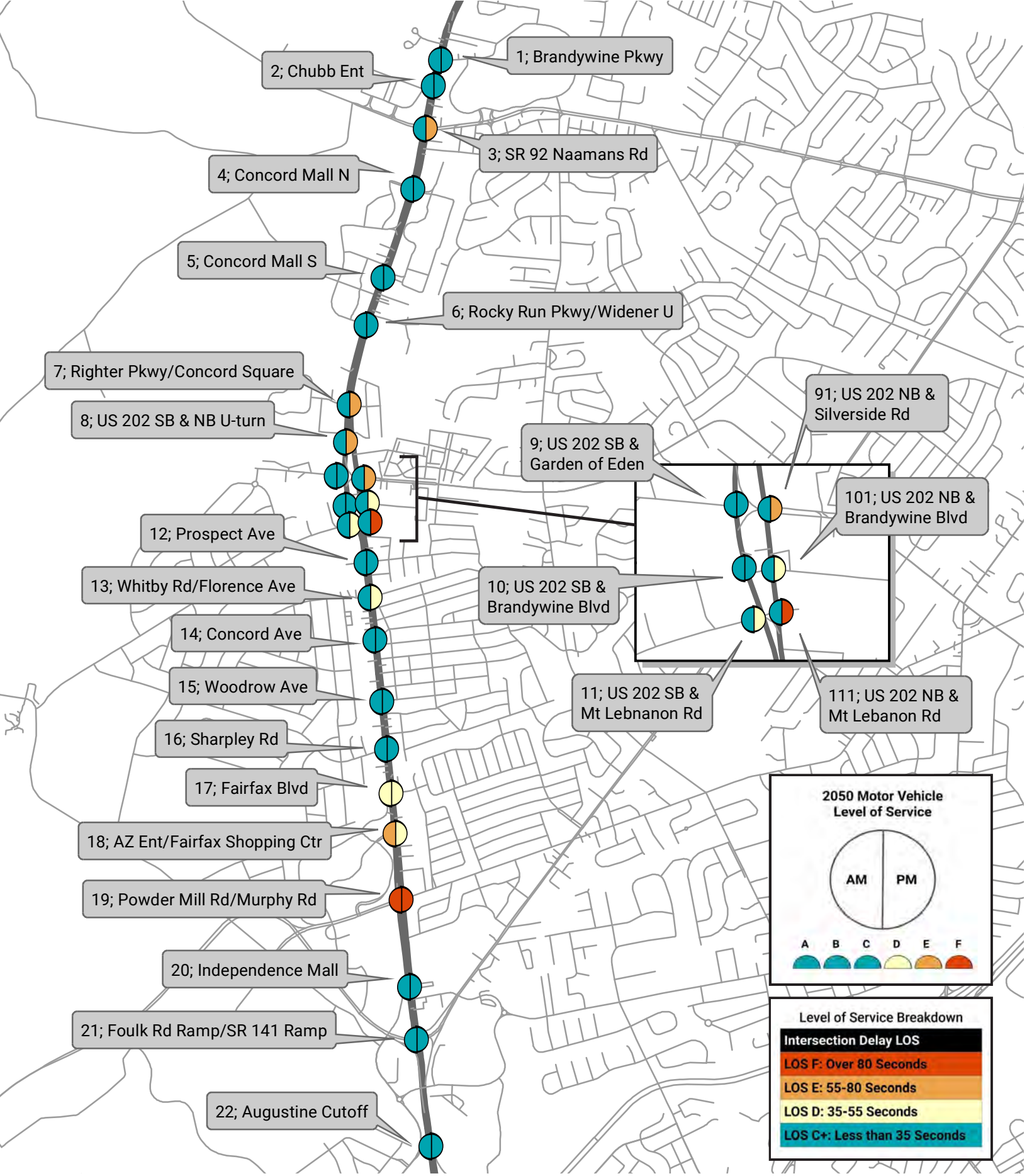

Figure 9: By-Right Development

Enhanced Vehicle Network

Concord Pike (US 202)

0 900 1,800 3,600 Feet

N

TOOLE DESIGN

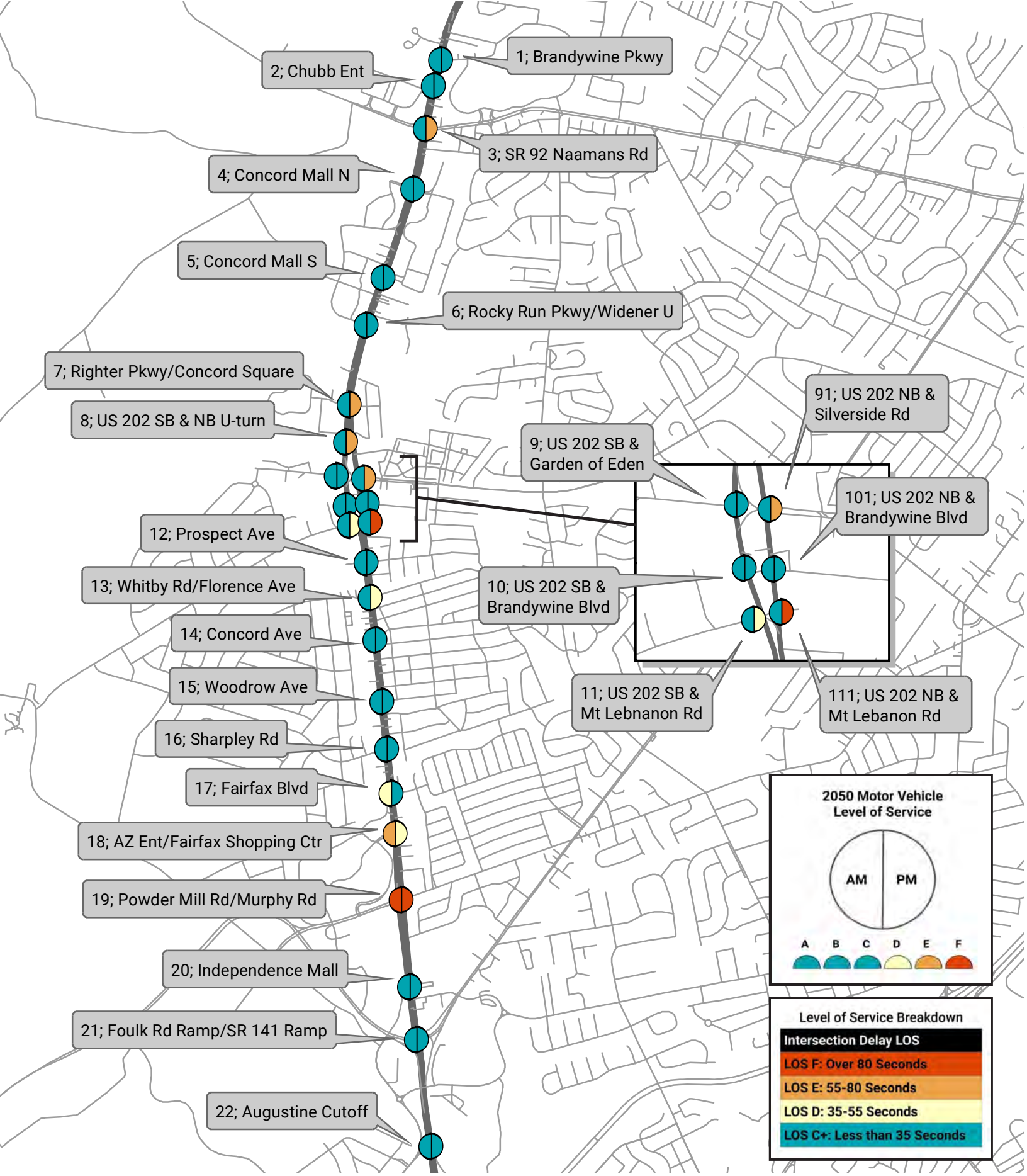

Figure 10: By-right Development

Enhanced Ped/Bike Network

Concord Pike (US 202)

0 900 1,800 3,600 Feet

N

TOOLE DESIGN

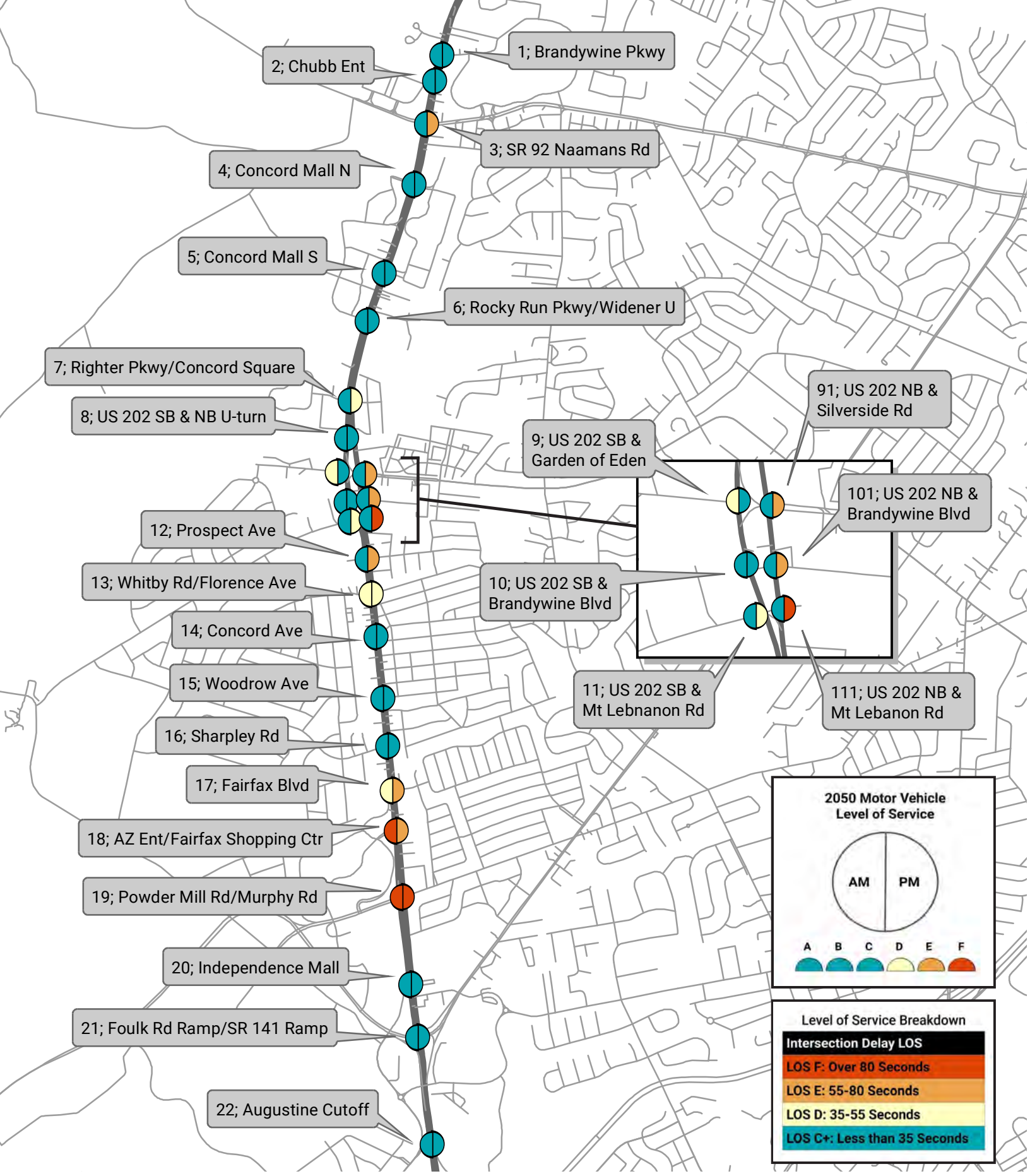

Figure 11: Proposed Zoning - Low

Do Nothing

Concord Pike (US 202)

0 900 1,800 3,600 Feet

TOOLE DESIGN

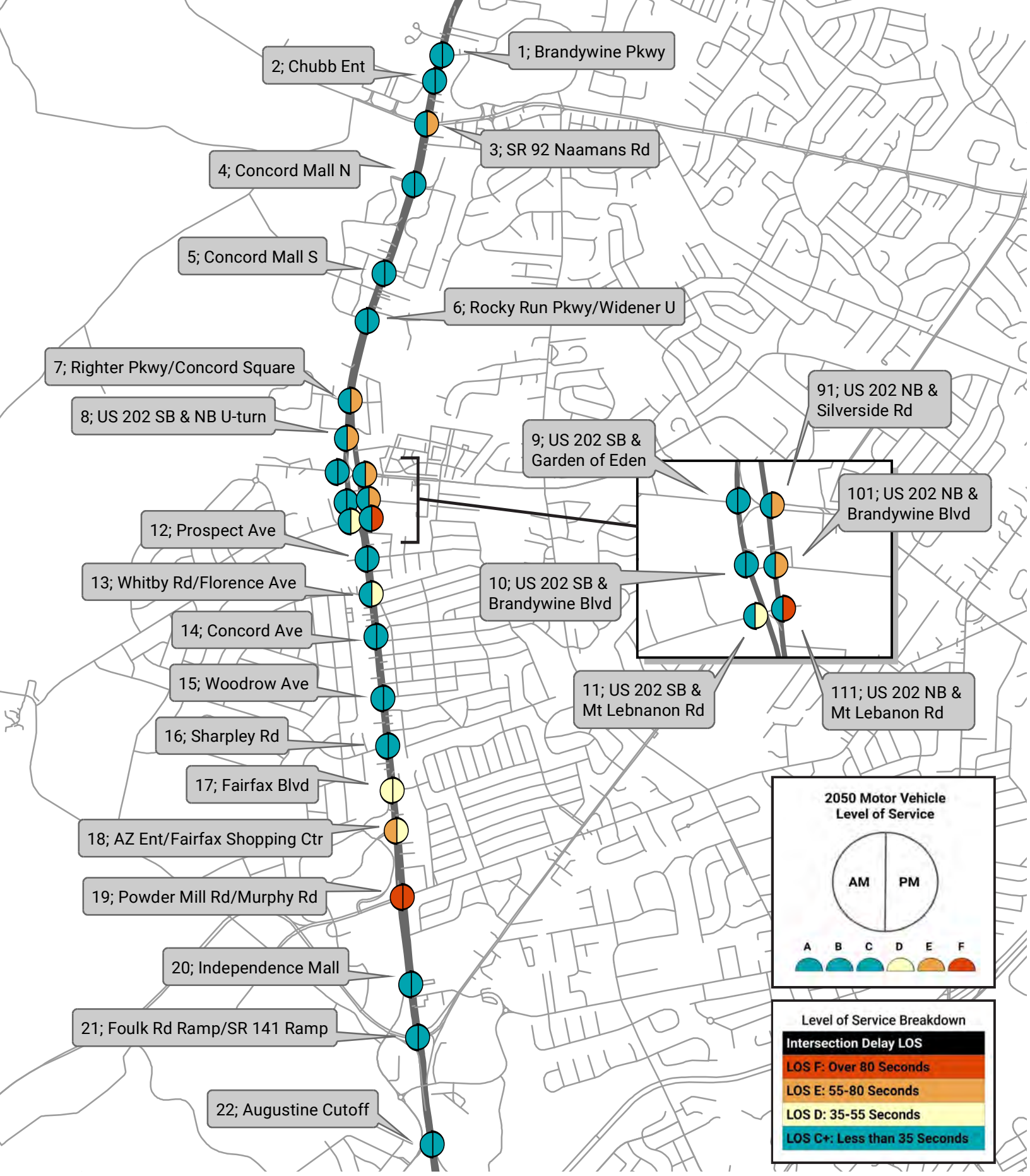

Figure 12: Proposed Zoning - Low

Enhanced Vehicle Network

Concord Pike (US 202)

0 900 1,800 3,600 Feet

N

TOOLE DESIGN

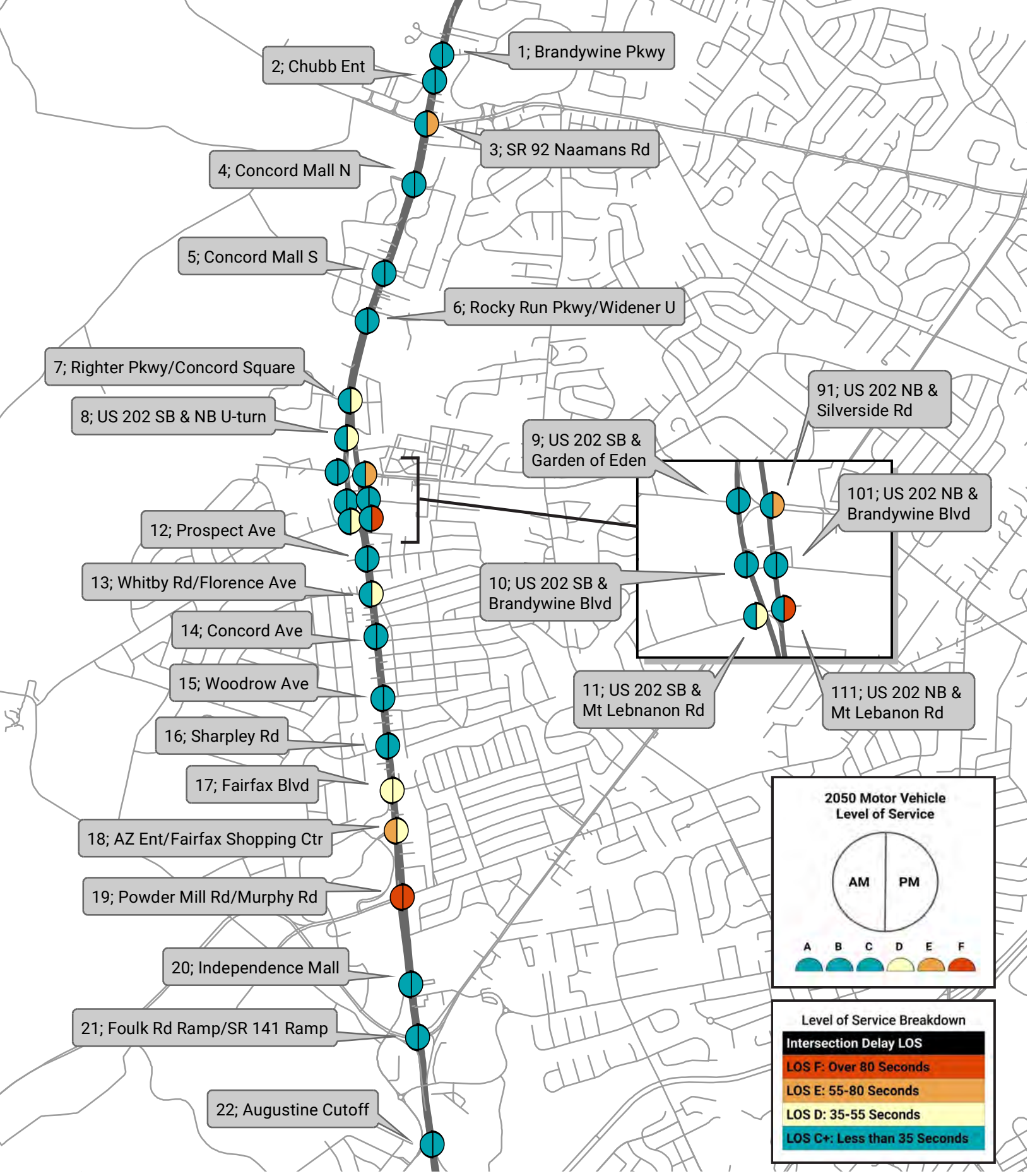

Figure 13: Proposed Zoning - Low

Enhanced Ped/Bike Network

Concord Pike (US 202)

0 900 1,800 3,600 Feet

N

TOOLE DESIGN

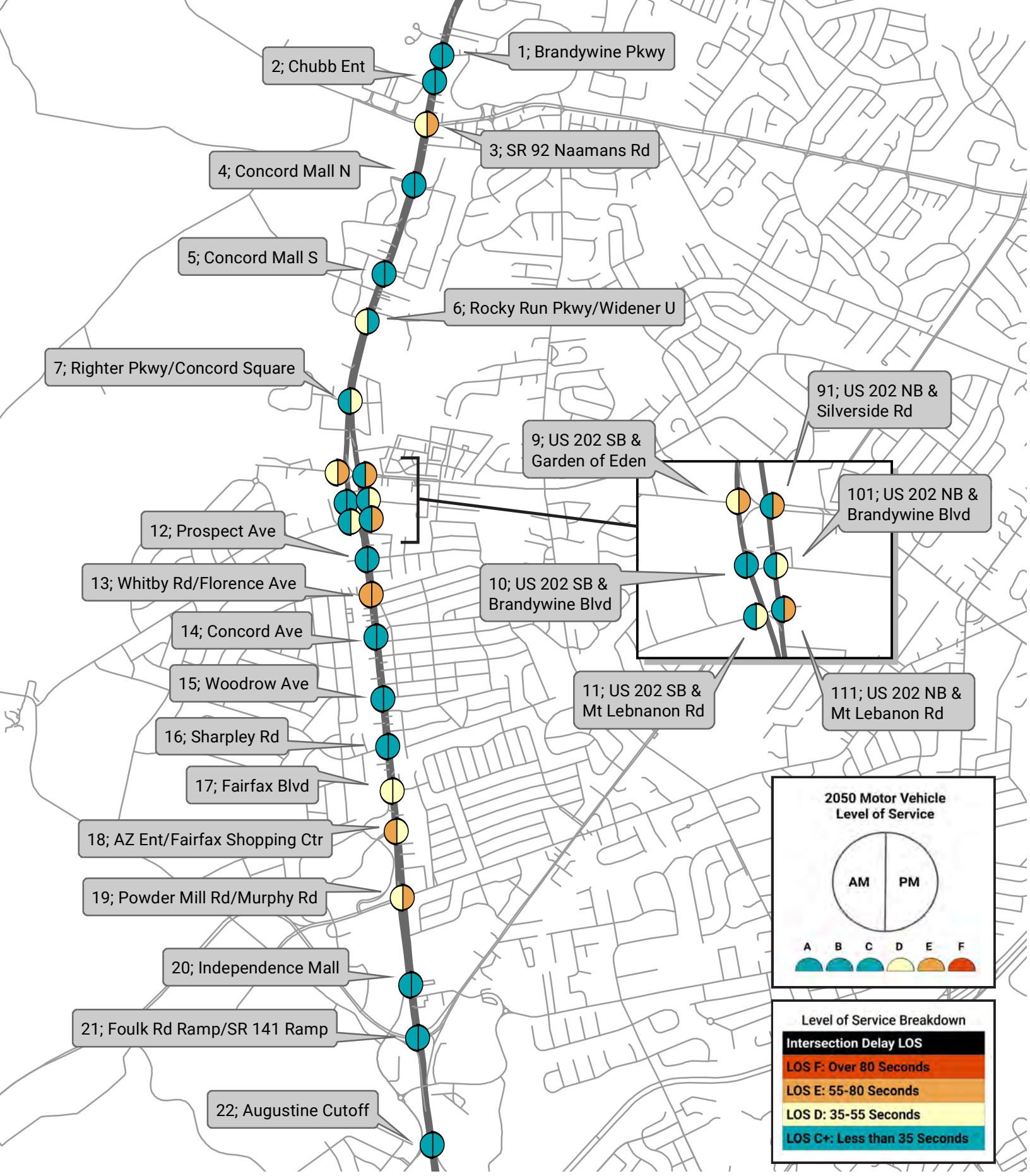

Figure 14: Proposed Zoning - Low

Mulitmodal Improvements

Concord Pike (US 202)

0 900 1,800 3,600 Feet

N

TOOLE DESIGN

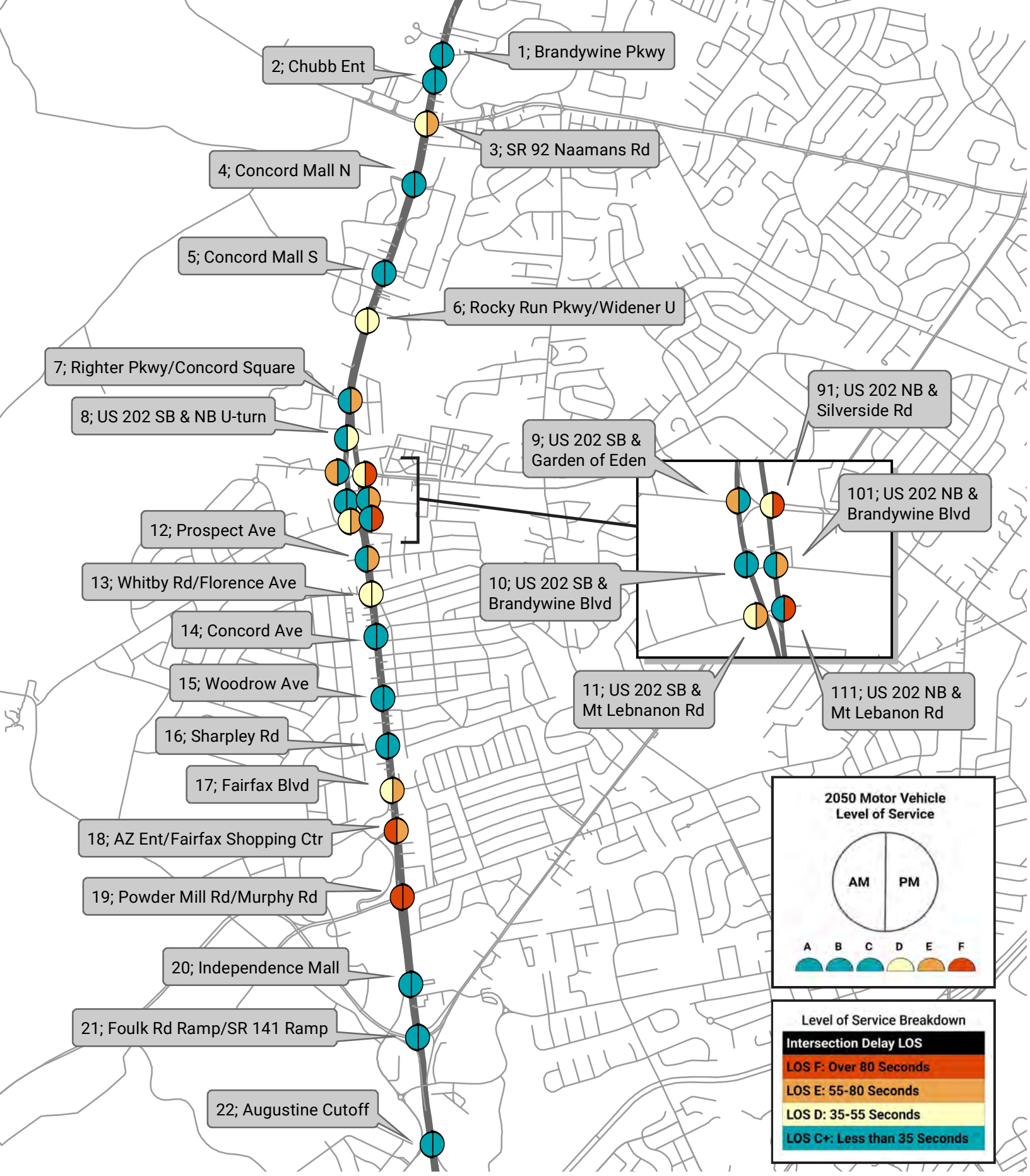

Figure 15: Proposed Zoning - High

Do Nothing

Concord Pike (US 202)

0 900 1,800 3,600 Feet

N

TOOLE DESIGN

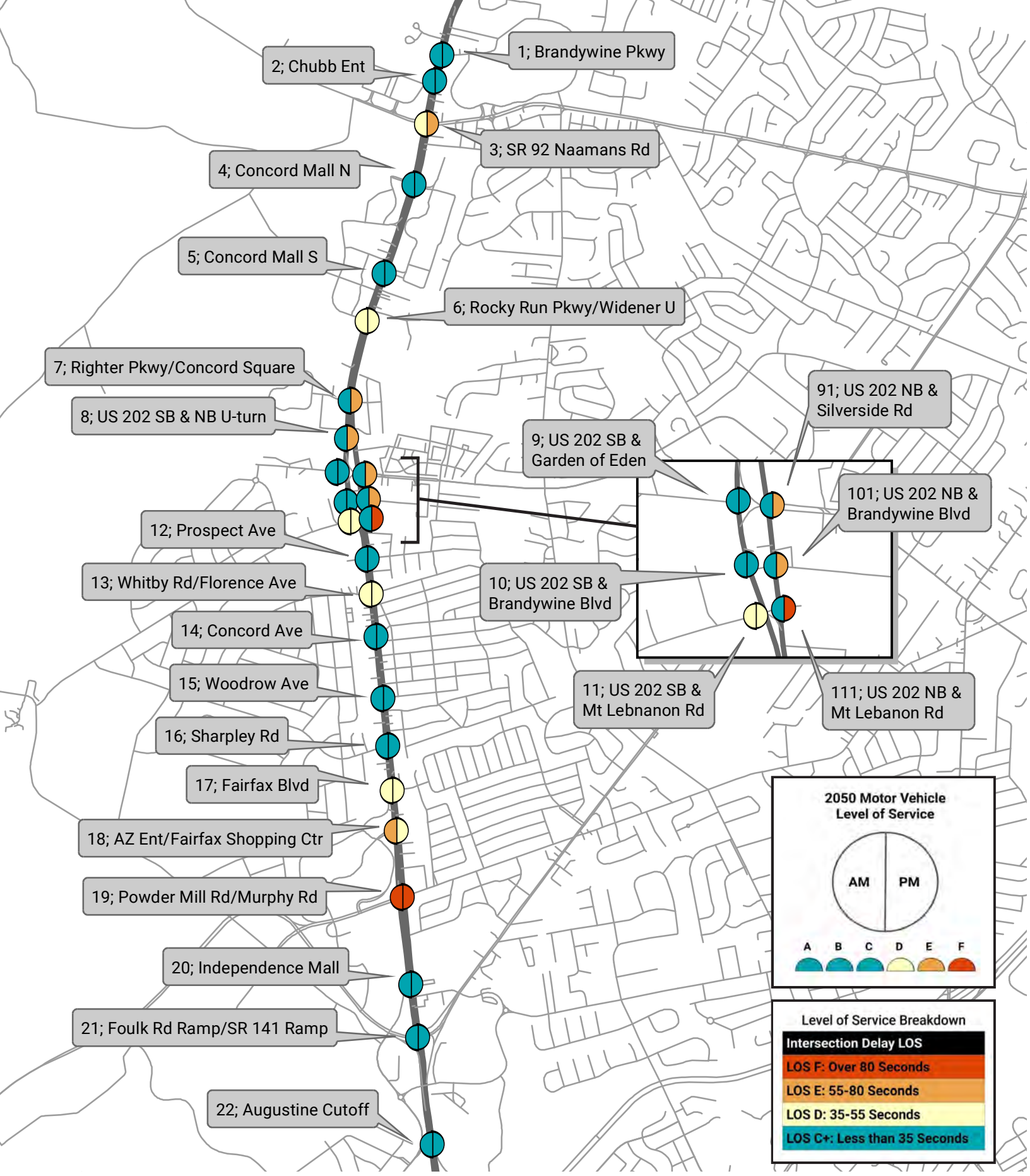

Figure 16: Proposed Zoning - High

Enhanced Vehicle Network

Concord Pike (US 202)

0 900 1,800 3,600 Feet

TOOLE DESIGN

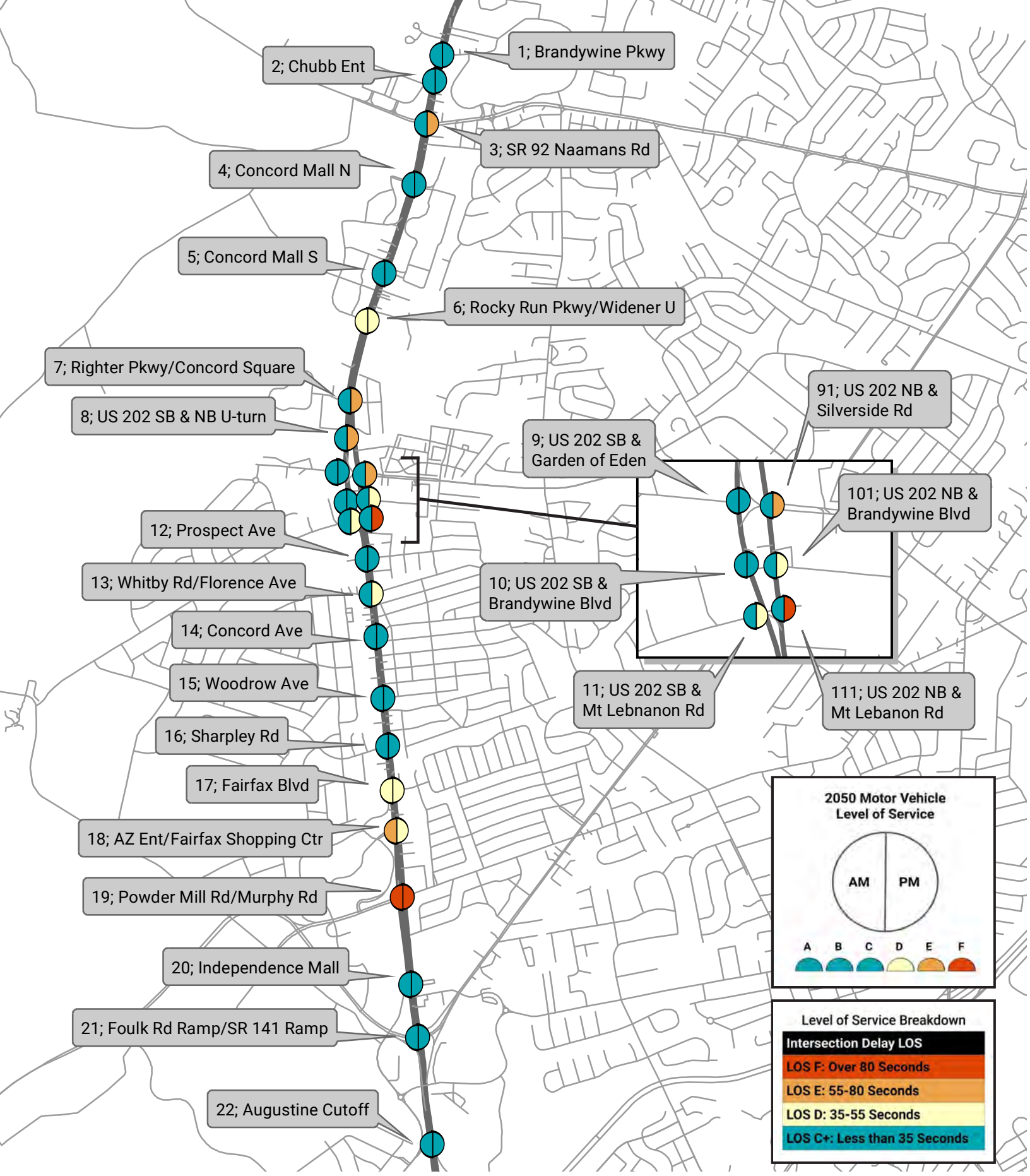

Figure 17: Proposed Zoning - High

Enhanced Ped/Bike Network

Concord Pike (US 202)

0 900 1,800 3,600 Feet

N

TOOLE DESIGN

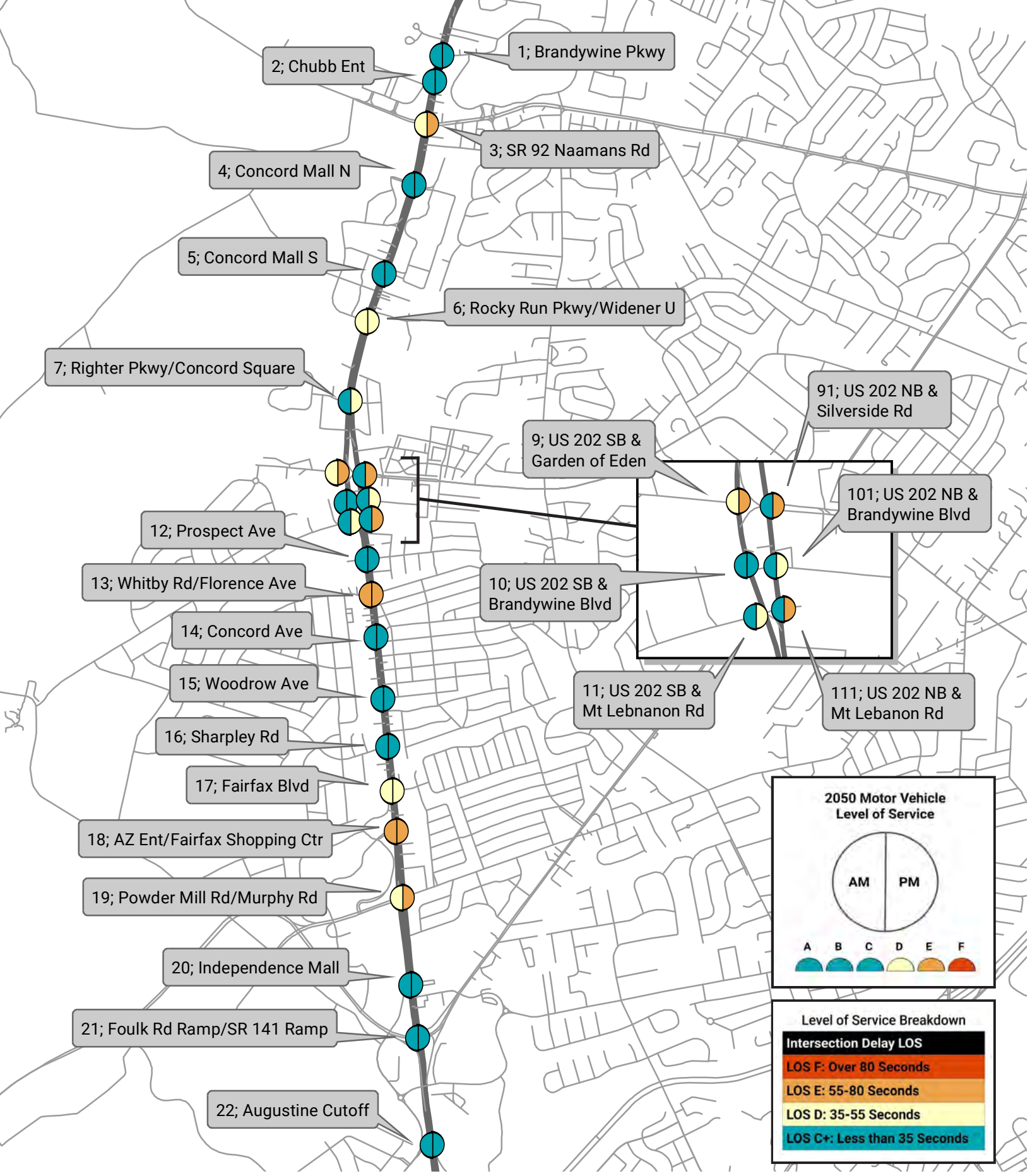

Figure 18: Proposed Zoning - High

Mulitmodal Improvements

Concord Pike (US 202)

0 900 1,800 3,600 Feet

N

TOOLE DESIGN

4. Conclusions and Key Takeaways

The Concord Pike (US 202) Corridor Master Plan was undertaken to envision future land use and transportation development opportunities along Concord Pike. In accordance with the vision for Concord Pike, which includes more walkable environments, strategies to reduce speeding and relieve heavy traffic, and additional pedestrian and bicycle trails and crossings, the traffic analysis was conducted with a multimodal approach including walking, taking the bus, biking, and driving. A combination of land use and transportation scenarios were studied which included varying levels of development and transportation scenarios with different mode splits, trip assignment, and trip distributions onto the network coming to or from the development sites.

Based on the vision for the corridor the traffic analysis was conducted with the understanding that the capacity or value of a street is more than the number of cars – it can also encourage pedestrian activity, enhance connections to surrounding land uses, and support economic vitality. The following key takeaways were taken from the traffic analysis.

- Increases in delay for motorists are similar regardless of whether the area redevelops consistent with existing zoning or using the proposed zoning scenarios.
- Addition of roadway connections within re-development sites and additional pedestrian and bicycle connections will provide relief to delay for motorists.
- There are many opportunities to provide improved connections and options for people biking within the neighborhoods surrounding Concord Pike, crossing Concord Pike and adjacent to Concord Pike.
- A large menu of treatments is available to improve signalized intersections for people walking. In some cases, adding these treatments could increase delay for motorists.
- There are plans for bus service improvements on the corridor in the coming months and additional plans for longer term changes.
- The implementation of these recommendations will come in many forms – using existing programs, and potential new programs and policies.

5. Appendices

Appendix A: Mode split Tables

Appendix B: Trip Generation by Parcel

Appendix C: Trip Assignment Figures

Appendix D: Scenario Volumes

Appendix E: Detailed LOS Tables

Appendix A

Mode split Tables

Table 9: Baseline Mode split – AM Peak[1]

Land Use Category	Entering				Exiting			
	Vehicle Occupancy	% Transit	% Non-Motorized	% Auto	Vehicle Occupancy	% Transit	% Non-Motorized	% Auto
Residential	1.13	1%	4%	95%	1.09	0%	2%	98%
Office	1.06	1%	0%	99%	1.06	0%	0%	100%
Retail	1.17	0%	0%	100%	1.16	0%	0%	100%
Hotel	1.00	0%	0%	100%	1.00	0%	0%	100%
All Other	1.00	0%	0%	100%	1.00	0%	0%	100%

Table 10: Baseline Mode split – PM Peak

Land Use Category	Entering				Exiting			
	Vehicle Occupancy	% Transit	% Non-Motorized	% Auto	Vehicle Occupancy	% Transit	% Non-Motorized	% Auto
Residential	1.15	1%	3%	96%	1.21	4%	0%	96%
Office	1.11	0%	0%	100%	1.07	0%	1%	99%
Retail	1.21	0%	0%	100%	1.18	0%	0%	100%
Hotel	1.00	0%	0%	100%	1.00	0%	0%	100%
All Other	1.00	0%	0%	100%	1.00	0%	0%	100%

[1] Source: ITE Trip Generation Handbook, 3rd Edition
DelDOT's Household Survey, Selected Data for New Castle County (1995-2007)
Delaware Valley Regional Planning Commission, 2012 Household Travel Survey

Table 11: Enhanced Ped/Bike Mode split

Land Use Category	AM Peak				PM Peak			
	Vehicle Occupancy	% Transit	% Non-Motorized	% Auto	Vehicle Occupancy	% Transit	% Non-Motorized	% Auto
Residential	1.15	4%	20%	76%	1.22	4%	26%	70%
Office	1.11	4%	9%	87%	1.14	4%	9%	87%
Retail	1.17	0%	1%	99%	1.20	0%	16%	84%
Hotel	1.00	0%	0%	100%	1.00	0%	0%	100%
All Other	1.00	0%	0%	100%	1.00	0%	0%	100%

Appendix B

Trip Generation by Parcel

Table 12: By-Right Development Trip Generation, Baseline mode split – AM Peak

Parcel	Total Person Trips	Entering					Exiting				
		Person Trips In	Auto-driver	Auto-passenger	Transit	Non-motorized	Person Trips Out	Auto-driver	Auto-passenger	Transit	Non-motorized
4	503	265	241	22	0	1	238	218	19	0	2
5a	-19	-4	-1	-5	1	1	-15	-13	-3	0	1
5b	0	0	0	0	0	0	0	0	0	0	0
7	104	86	79	6	1	0	18	16	2	0	0
8	69	61	55	5	1	0	8	7	1	0	0
9e	123	32	27	4	0	1	91	82	7	0	2
11	148	100	92	6	1	0	48	44	4	0	1
12	-30	-110	-108	-2	-1	1	80	70	8	0	2
16a	138	83	80	3	0	0	55	53	2	0	0
16b	0	0	0	0	0	0	0	0	0	0	0
23	832	517	475	35	4	3	315	285	25	0	4
Total	**1,867**	**1,029**	**940**	**74**	**7**	**7**	**838**	**762**	**65**	**0**	**11**

Table 13: By-Right Development Trip Generation, Baseline mode split – PM Peak

Parcel	Total Person Trips	Entering							Exiting						
		Person Trips In	Primary Auto-driver	Primary Auto-passenger	Passby Auto-driver	Passby Auto-passenger	Transit	Non-motorized	Person Trips Out	Primary Auto-driver	Primary Auto-passenger	Passby Auto-driver	Passby Auto-passenger	Transit	Non-motorized
4	1,117	564	368	54	116	24	0	1	554	368	47	116	21	1	0
5a	-448	-246	-131	-24	-77	-16	0	1	-202	-87	-18	-84	-15	1	1
5b	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	190	70	42	8	17	3	0	0	120	87	10	19	3	0	1
8	130	44	21	6	14	3	0	0	86	59	8	16	3	0	0
9e	175	108	91	14	0	0	1	3	66	53	11	0	0	2	0
11	158	55	47	7	0	0	0	1	103	92	9	0	0	1	1
12	87	125	79	16	23	5	1	2	-37	-68	6	20	4	2	-2
16a	275	137	105	8	20	4	0	0	138	107	7	20	4	0	0
16b	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	1,173	467	355	52	43	9	2	6	707	588	64	39	7	5	4
Total	**2,858**	**1,324**	**978**	**140**	**154**	**32**	**5**	**14**	**1,534**	**1,199**	**146**	**146**	**26**	**13**	**5**

Table 14: By-Right Development Trip Generation, Enhanced ped/bike mode split – AM Peak

Parcel	Total Person Trips	Entering					Exiting				
		Person Trips In	Auto-driver	Auto-passenger	Transit	Non-motorized	Person Trips Out	Auto-driver	Auto-passenger	Transit	Non-motorized
4	503	265	234	21	1	8	238	199	17	4	19
5a	-19	-4	-14	-6	5	11	-15	-24	-4	3	10
5b	0	0	0	0	0	0	0	0	0	0	0
7	104	86	71	6	3	6	18	15	2	0	1
8	69	61	48	5	3	6	8	6	1	0	1
9e	123	32	21	3	1	6	91	63	6	4	18
11	148	100	80	5	4	10	48	35	3	2	8
12	-30	-110	-94	-2	-6	-8	80	55	7	3	16
16a	138	83	80	3	0	0	55	53	2	0	0
16b	0	0	0	0	0	0	0	0	0	0	0
23	833	518	417	30	20	50	315	231	20	12	52
Total	**1,869**	**1,030**	**842**	**66**	**32**	**90**	**839**	**633**	**53**	**29**	**124**

Table 15: By-Right Development Trip Generation, Enhanced ped/bike mode split – PM Peak

Parcel	Total Person Trips	Entering							Exiting						
		Person Trips In	Primary Auto-driver	Primary Auto-passenger	Passby Auto-driver	Passby Auto-passenger	Transit	Non-motorized	Person Trips Out	Primary Auto-driver	Primary Auto-passenger	Passby Auto-driver	Passby Auto-passenger	Transit	Non-motorized
4	1,118	564	321	44	97	20	2	79	554	323	39	97	17	2	75
5a	-447	-246	-119	-21	-65	-14	3	-30	-201	-78	-16	-70	-13	5	-30
5b	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	190	70	36	7	14	3	0	10	120	75	9	16	3	2	15
8	130	44	16	5	11	2	0	9	86	48	7	13	2	2	13
9e	176	109	66	10	0	0	5	28	67	38	8	0	0	3	17
11	158	55	36	5	0	0	2	12	103	77	8	0	0	4	14
12	88	125	58	12	19	4	2	30	-37	-68	4	17	3	-5	12
16a	275	137	99	7	17	3	0	11	138	100	6	17	3	0	11
16b	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	1,176	468	282	41	36	8	13	88	708	497	52	33	6	24	96
Total	**2,864**	**1,326**	**794**	**110**	**129**	**27**	**28**	**238**	**1,537**	**1,014**	**117**	**122**	**22**	**38**	**224**

Table 16: Proposed Zoning – Low Development Trip Generation, Baseline mode split – AM Peak

Parcel	Total Person Trips	Entering					Exiting				
		Person Trips In	Auto-driver	Auto-passenger	Transit	Non-motorized	Person Trips Out	Auto-driver	Auto-passenger	Transit	Non-motorized
4	503	265	241	22	0	1	238	218	19	0	2
5a	12	-13	-11	-4	1	1	25	22	1	0	2
5b	40	11	9	1	0	0	29	26	2	0	1
7	50	19	16	2	0	0	31	28	3	0	0
8	116	92	86	6	1	0	23	22	1	0	0
9e	123	32	27	4	0	1	91	82	7	0	2
11	109	57	53	3	1	1	52	48	4	0	1
12	-30	-110	-108	-2	-1	1	80	70	8	0	2
16a	298	124	115	8	0	2	174	160	11	0	2
16b	98	-21	-22	0	-1	1	119	108	9	0	2
23	641	260	234	19	2	4	381	346	29	0	6
Total	**1,959**	**715**	**640**	**59**	**3**	**13**	**1,244**	**1,131**	**94**	**0**	**19**

Table 17: Proposed Zoning – Low Development Trip Generation, Baseline mode split – PM Peak

Parcel	Total Person Trips	Entering							Exiting						
		Person Trips In	Primary Auto-driver	Primary Auto-passenger	Passby Auto-driver	Passby Auto-passenger	Transit	Non-motorized	Person Trips Out	Primary Auto-driver	Primary Auto-passenger	Passby Auto-driver	Passby Auto-passenger	Transit	Non-motorized
4	1,117	564	368	54	116	24	0	1	554	368	47	116	21	1	0
5a	-361	-181	-85	-16	-69	-15	1	2	-179	-81	-12	-75	-14	2	1
5b	52	32	27	4	0	0	0	1	20	16	3	0	0	1	0
7	87	48	33	6	7	1	0	1	39	26	5	6	1	1	0
8	200	76	51	7	15	3	0	0	124	94	9	17	3	0	0
9e	175	108	91	14	0	0	1	3	66	53	11	0	0	2	0
11	60	26	31	3	-9	-2	0	1	35	40	5	-10	-2	1	0
12	87	125	79	16	23	5	1	2	-37	-68	6	20	4	2	-2
16a	438	240	193	21	18	4	1	3	198	159	19	15	3	3	0
16b	220	174	131	17	18	4	1	2	46	19	9	15	3	2	-1
23	759	405	353	47	-7	-2	3	10	354	310	44	-8	-1	8	1
Total	**2,834**	**1,616**	**1,273**	**173**	**111**	**23**	**9**	**27**	**1,218**	**937**	**146**	**95**	**17**	**23**	**0**

Table 18: Proposed Zoning – Low Development Trip Generation, Enhanced ped/bike mode split – AM Peak

Parcel	Total Person Trips	Entering					Exiting				
		Person Trips In	Auto-driver	Auto-passenger	Transit	Non-motorized	Person Trips Out	Auto-driver	Auto-passenger	Transit	Non-motorized
4	503	265	234	21	1	8	238	199	17	4	19
5a	12	-13	-24	-5	4	12	25	4	-1	4	17
5b	40	11	7	1	0	2	29	20	2	1	6
7	50	19	14	2	0	2	31	22	2	1	5
8	116	92	79	5	3	6	23	21	1	0	1
9e	123	32	21	3	1	6	91	63	6	4	18
11	110	57	44	3	3	8	52	36	3	3	11
12	-30	-110	-94	-2	-6	-8	80	55	7	3	16
16a	298	125	107	7	2	9	174	135	9	5	24
16b	98	-21	-14	0	-4	-3	119	91	7	3	18
23	642	261	200	15	10	35	382	273	22	16	71
Total	**1,963**	**718**	**575**	**50**	**16**	**76**	**1,245**	**920**	**75**	**45**	**206**

Table 19: Proposed Zoning – Low Development Trip Generation, Enhanced ped/bike mode split – PM Peak

Parcel	Total Person Trips	Entering							Exiting						
		Person Trips In	Primary Auto-driver	Primary Auto-passenger	Passby Auto-driver	Passby Auto-passenger	Transit	Non-motorized	Person Trips Out	Primary Auto-driver	Primary Auto-passenger	Passby Auto-driver	Passby Auto-passenger	Transit	Non-motorized
4	1,118	564	321	44	97	20	2	79	554	323	39	97	17	2	75
5a	-360	-181	-86	-15	-58	-12	4	-15	-179	-77	-12	-63	-11	5	-21
5b	53	32	20	3	0	0	1	8	20	12	2	0	0	1	5
7	87	48	25	5	6	1	1	10	39	20	4	5	1	1	8
8	200	76	46	6	12	3	0	9	124	83	8	14	3	2	14
9e	176	109	66	10	0	0	5	28	67	38	8	0	0	3	17
11	61	26	21	2	-8	-2	3	9	35	31	3	-8	-1	3	7
12	88	125	58	12	19	4	2	30	-37	-68	4	17	3	-5	12
16a	439	241	162	16	15	3	5	40	198	137	14	12	2	4	29
16b	221	174	107	13	15	3	3	33	46	13	6	13	2	-2	15
23	762	407	264	34	-6	-1	18	98	356	247	33	-7	-1	15	68
Total	**2,844**	**1,621**	**1,004**	**130**	**93**	**20**	**45**	**330**	**1,223**	**760**	**109**	**80**	**14**	**29**	**229**

Table 20: Proposed Zoning – High Development Trip Generation, Baseline mode split – AM Peak

Parcel	Total Person Trips	Entering					Exiting				
		Person Trips In	Auto-driver	Auto-passenger	Transit	Non-motorized	Person Trips Out	Auto-driver	Auto-passenger	Transit	Non-motorized
4	503	265	241	22	0	1	238	218	19	0	2
5a	150	59	52	4	1	2	92	82	8	0	2
5b	60	15	13	2	0	1	44	40	4	0	1
7	74	26	22	3	0	1	48	43	4	0	1
8	174	137	128	8	1	0	37	35	2	0	0
9e	123	32	27	4	0	1	91	82	7	0	2
11	109	57	53	3	1	1	52	48	4	0	1
12	-30	-110	-108	-2	-1	1	80	70	8	0	2
16a	316	108	101	5	1	2	207	191	13	0	3
16b	370	156	141	12	1	2	214	195	16	0	3
23	854	348	313	26	3	6	505	458	38	0	9
Total	**2,703**	**1,093**	**983**	**87**	**6**	**17**	**1,610**	**1,462**	**123**	**0**	**24**

Table 21: Proposed Zoning – High Development Trip Generation, Baseline mode split – PM Peak

Parcel	Total Person Trips	Entering							Exiting						
		Person Trips In	Primary Auto-driver	Primary Auto-passenger	Passby Auto-driver	Passby Auto-passenger	Transit	Non-motorized	Person Trips Out	Primary Auto-driver	Primary Auto-passenger	Passby Auto-driver	Passby Auto-passenger	Transit	Non-motorized
4	1,117	564	368	54	116	24	0	1	554	368	47	116	21	1	0
5a	-24	-18	19	3	-37	-8	1	4	-6	32	6	-40	-7	3	1
5b	84	51	43	6	0	0	0	1	33	26	5	0	0	1	0
7	130	72	49	9	11	2	0	1	58	39	8	9	2	1	0
8	310	120	83	10	22	5	0	0	191	147	13	25	5	0	1
9e	175	108	91	14	0	0	1	3	66	53	11	0	0	2	0
11	60	26	31	3	-9	-2	0	1	35	40	5	-10	-2	1	0
12	87	125	79	16	23	5	1	2	-37	-68	6	20	4	2	-2
16a	342	204	196	18	-14	-3	2	5	138	136	15	-15	-3	4	0
16b	531	293	222	31	28	6	1	4	238	180	27	23	4	4	0
23	1,035	545	471	64	-7	-2	5	14	490	426	62	-8	-1	11	2
Total	**3,848**	**2,090**	**1,654**	**229**	**131**	**28**	**12**	**36**	**1,758**	**1,378**	**206**	**121**	**22**	**30**	**2**

Table 22: Proposed Zoning – High Development Trip Generation, Enhanced ped/bike mode split – AM Peak

Parcel	Total Person Trips	Entering					Exiting				
		Person Trips In	Auto-driver	Auto-passenger	Transit	Non-motorized	Person Trips Out	Auto-driver	Auto-passenger	Transit	Non-motorized
4	503	265	234	21	1	8	238	199	17	4	19
5a	151	59	34	3	6	17	92	54	5	6	26
5b	60	15	10	1	1	3	44	31	3	2	9
7	74	26	19	3	1	3	48	35	4	2	8
8	174	137	118	7	4	8	37	34	2	0	1
9e	123	32	21	3	1	6	91	63	6	4	18
11	110	57	44	3	3	8	52	36	3	3	11
12	-30	-110	-94	-2	-6	-8	80	55	7	3	16
16a	316	109	91	3	3	12	207	156	10	8	35
16b	371	156	128	11	4	14	214	160	13	7	33
23	855	349	266	21	14	48	506	359	30	22	95
Total	**2,708**	**1,096**	**872**	**74**	**32**	**119**	**1,612**	**1,183**	**98**	**60**	**271**

Table 23: Proposed Zoning – High Development Trip Generation, Enhanced ped/bike mode split – PM Peak

Parcel	Total Person Trips	Entering							Exiting						
		Person Trips In	Primary Auto-driver	Primary Auto-passenger	Passby Auto-driver	Passby Auto-passenger	Transit	Non-motorized	Person Trips Out	Primary Auto-driver	Primary Auto-passenger	Passby Auto-driver	Passby Auto-passenger	Transit	Non-motorized
4	1,118	564	321	44	97	20	2	79	554	323	39	97	17	2	75
5a	-23	-17	-3	1	-31	-7	7	16	-6	15	4	-34	-6	7	8
5b	84	52	31	5	0	0	2	13	33	19	4	0	0	1	9
7	131	72	38	7	9	2	2	15	58	30	6	8	1	1	12
8	311	120	75	9	18	4	1	14	191	131	11	21	4	3	20
9e	176	109	66	10	0	0	5	28	67	38	8	0	0	3	17
11	61	26	21	2	-8	-2	3	9	35	31	3	-8	-1	3	7
12	88	125	58	12	19	4	2	30	-37	-68	4	17	3	-5	12
16a	344	205	158	12	-12	-2	8	41	139	114	10	-12	-2	5	24
16b	532	294	177	24	23	5	7	58	239	147	21	20	4	5	42
23	1,040	548	351	47	-6	-1	24	134	493	339	46	-7	-1	21	94
Total	**3,862**	**2,097**	**1,293**	**172**	**110**	**23**	**62**	**437**	**1,765**	**1,121**	**156**	**101**	**18**	**48**	**320**

Appendix C

Trip Assignment Figures

2050 Baseline - AM Volume Growth

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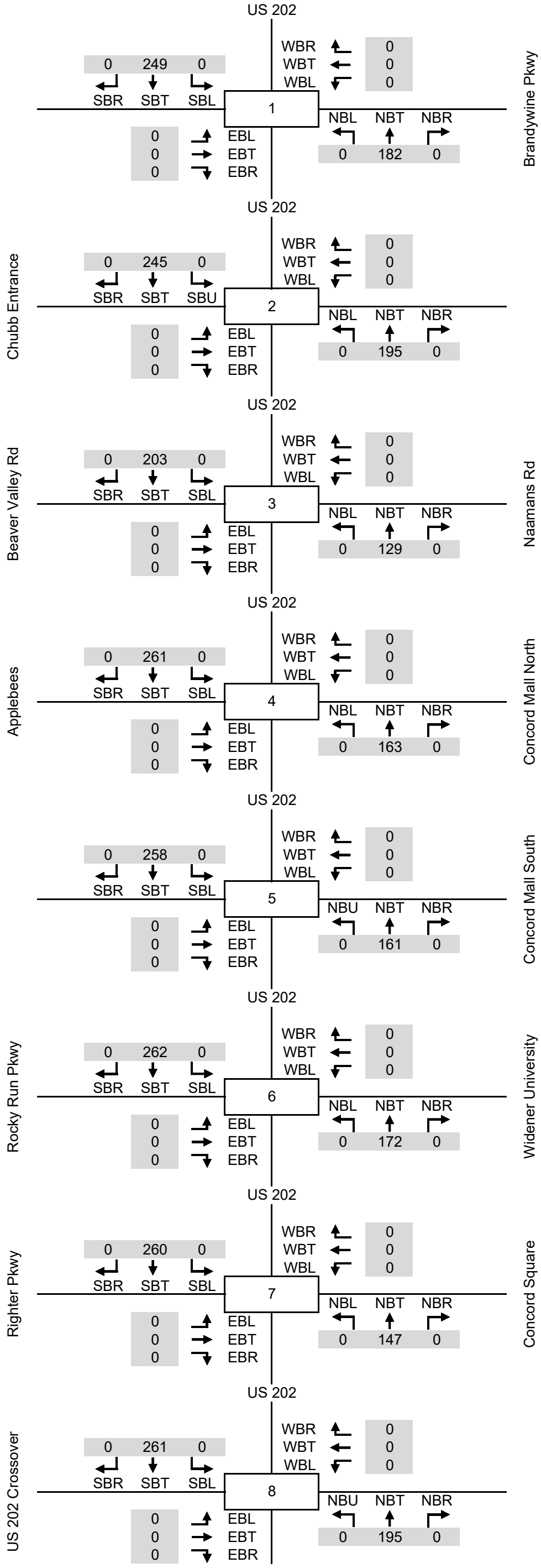

2050 Baseline - AM Volume Growth

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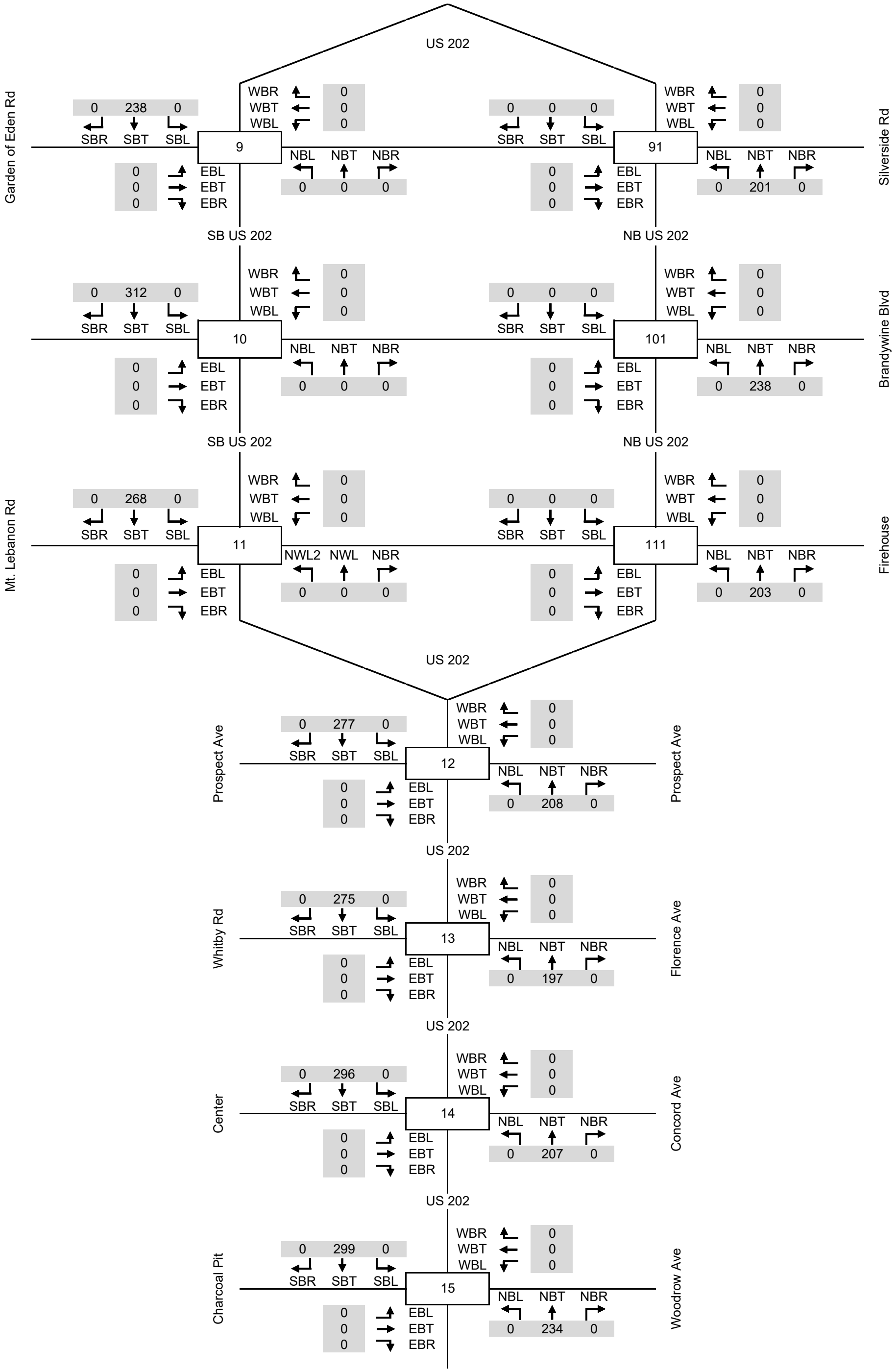

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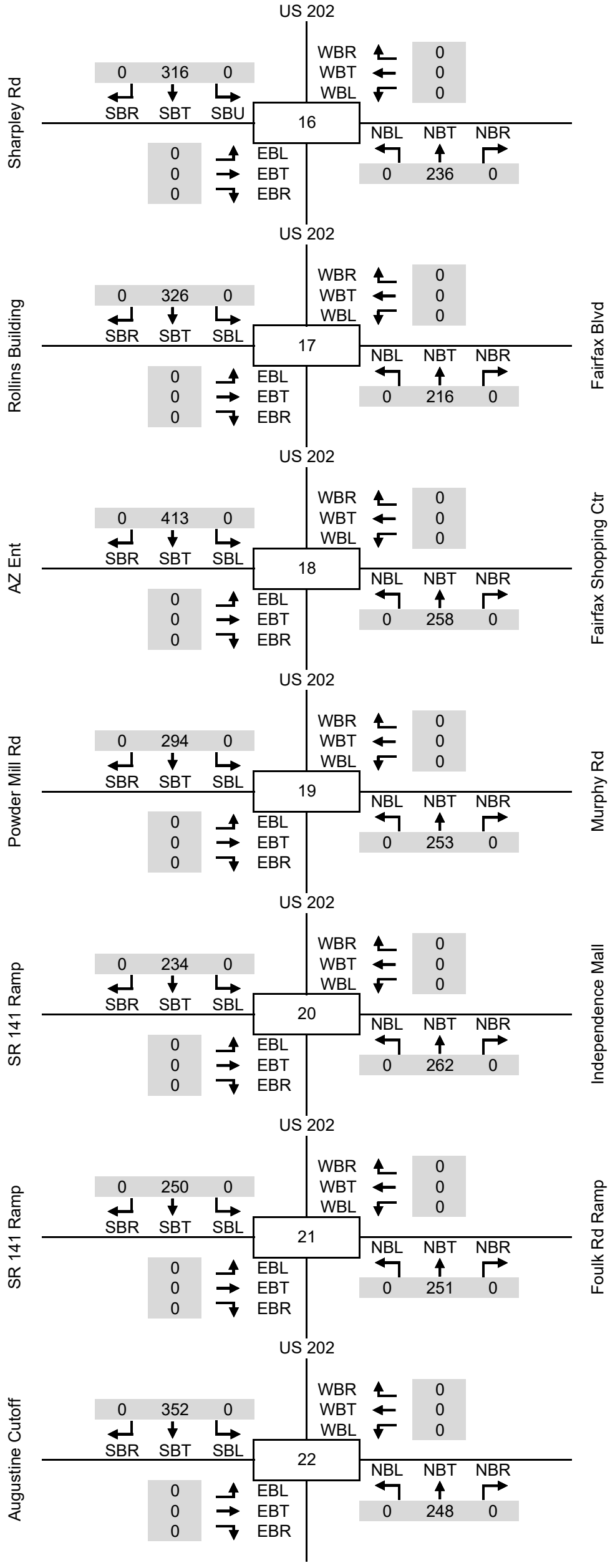

2050 Baseline - PM Volume Growth

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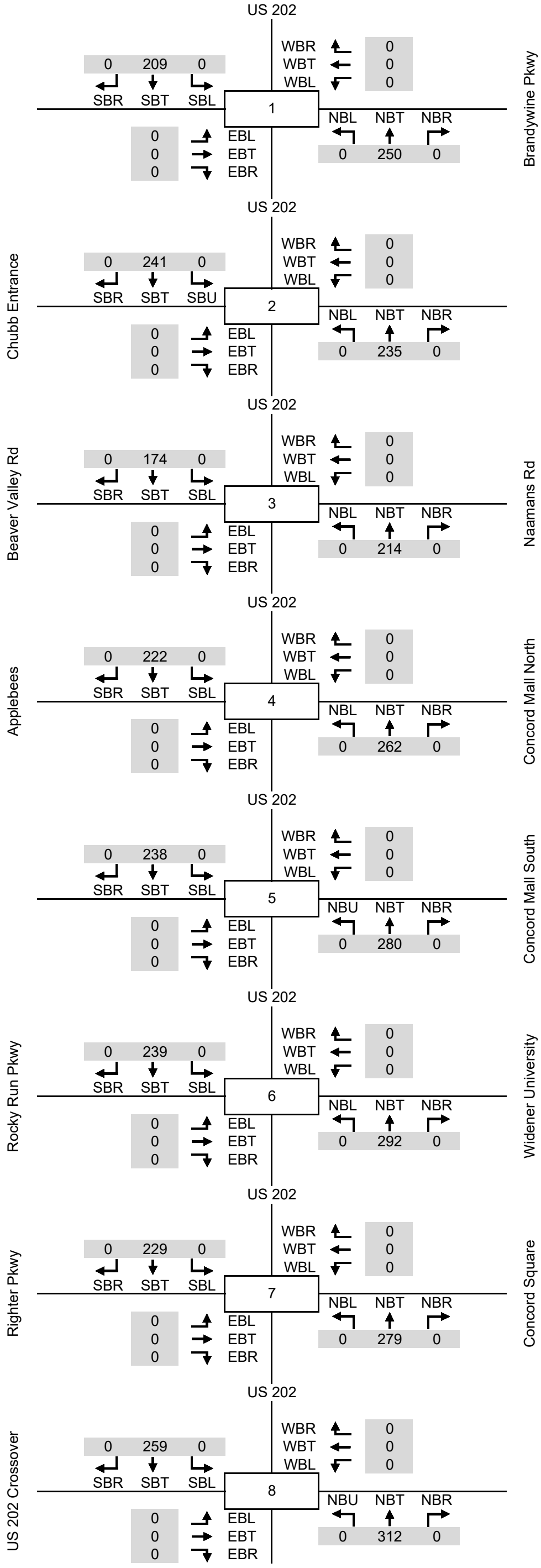

2050 Baseline Growth - PM Volume Growth

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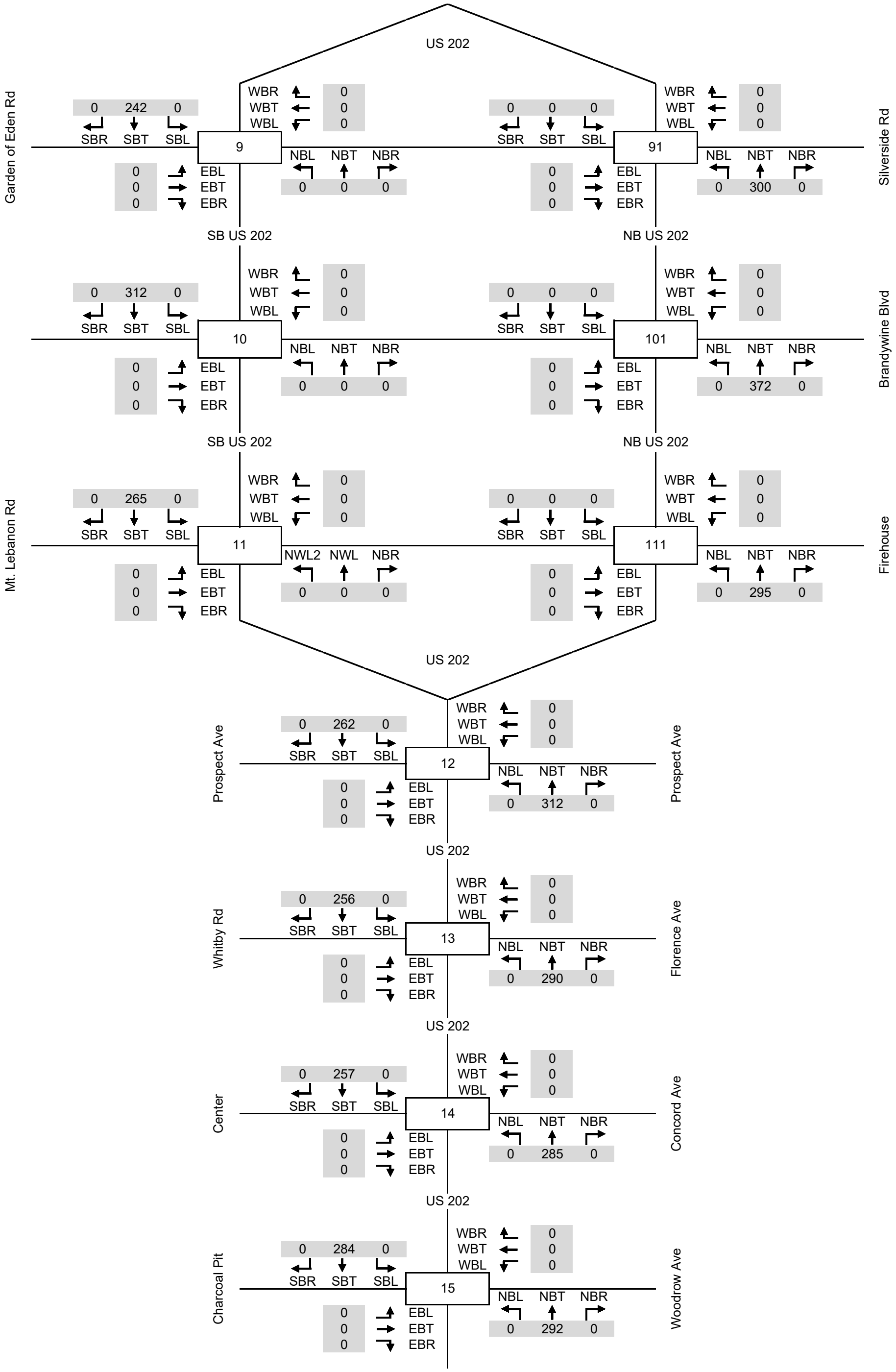

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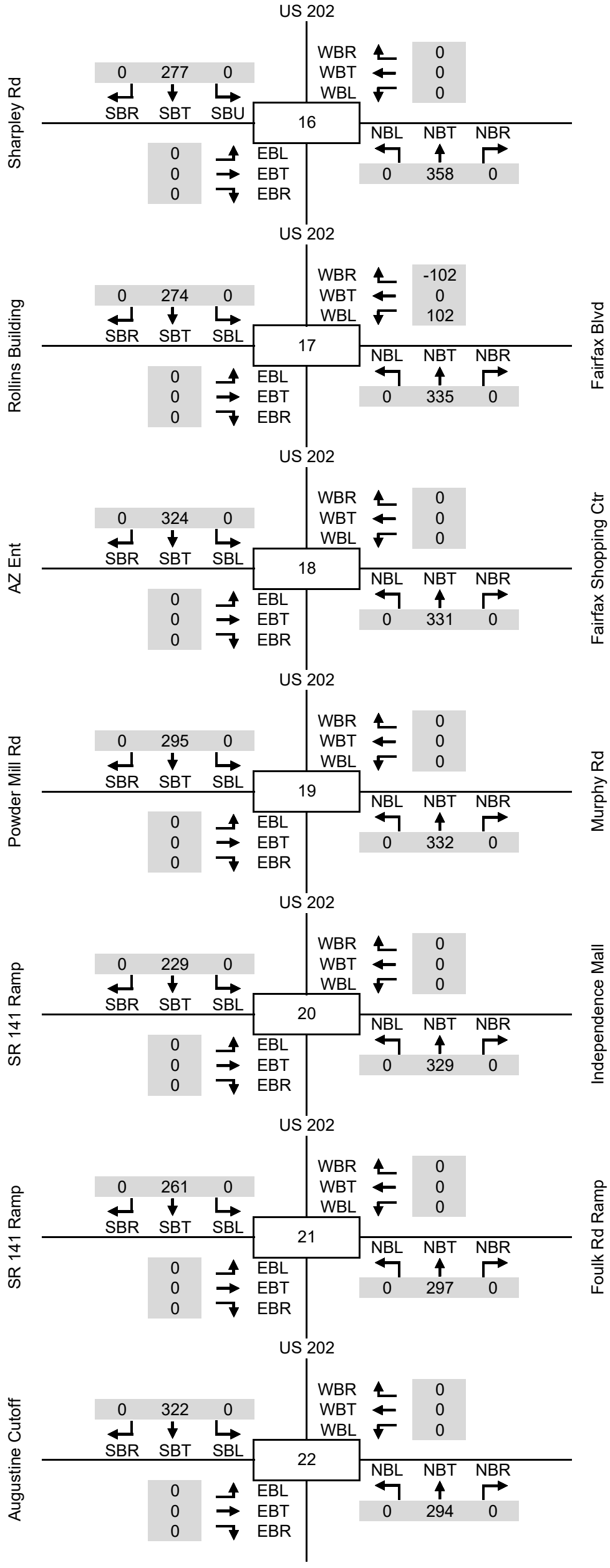

2050 By-right Development - AM Volume Growth

Exiting Transportation Infrastructure

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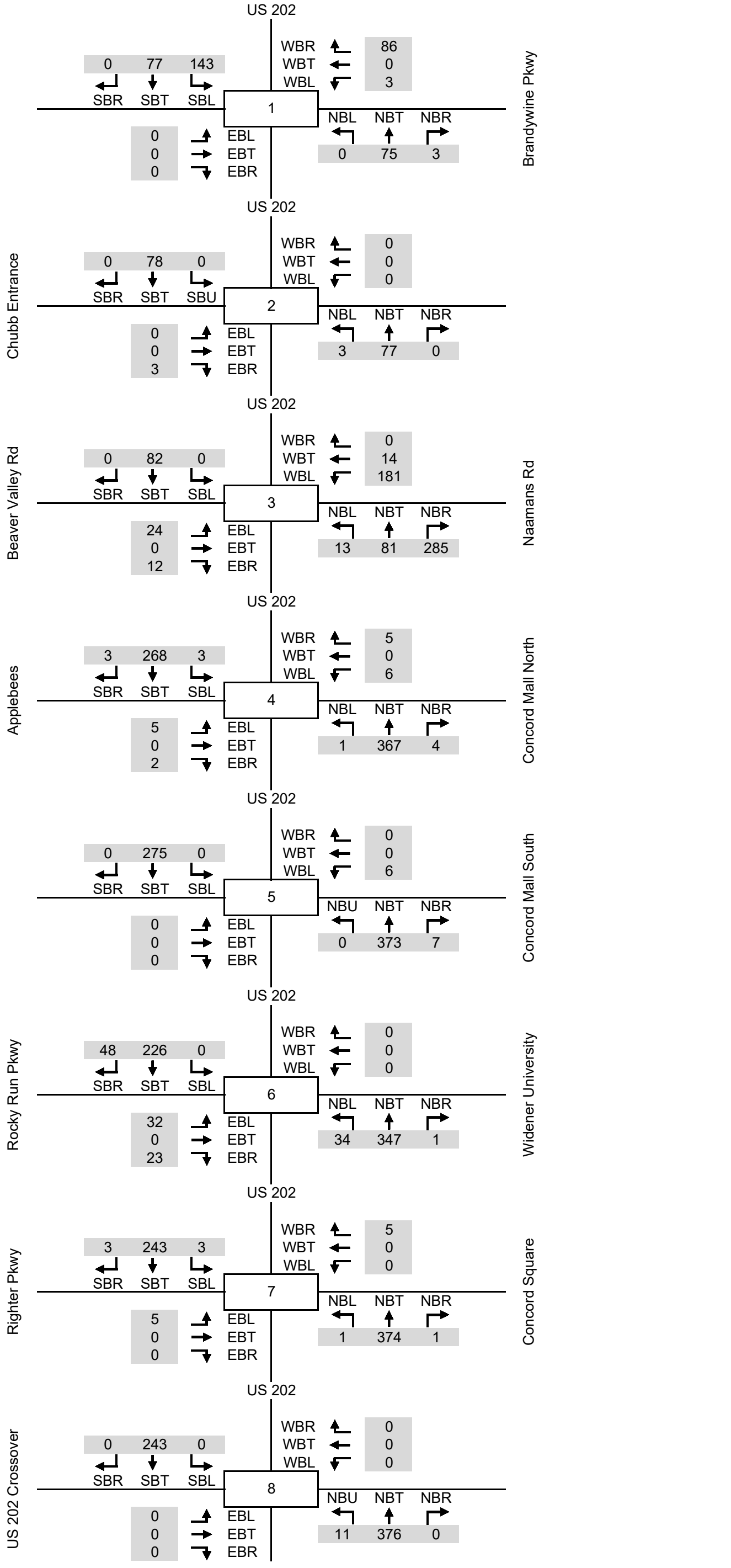

2050 By-right Development - AM Volume Growth

Exiting Transportation Infrastructure

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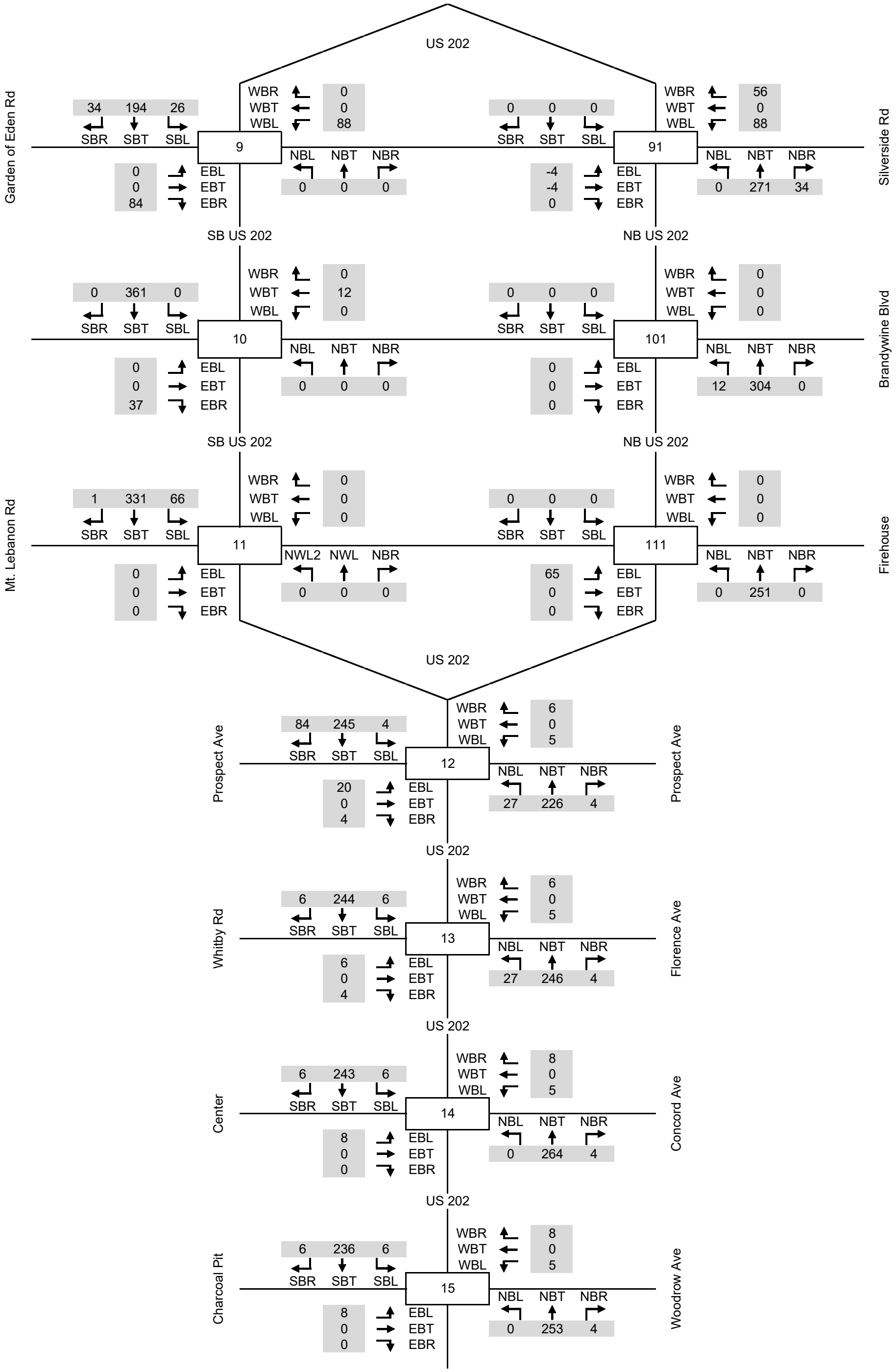

2050 By-right Development - AM Volume Growth

Exiting Transportation Infrastructure

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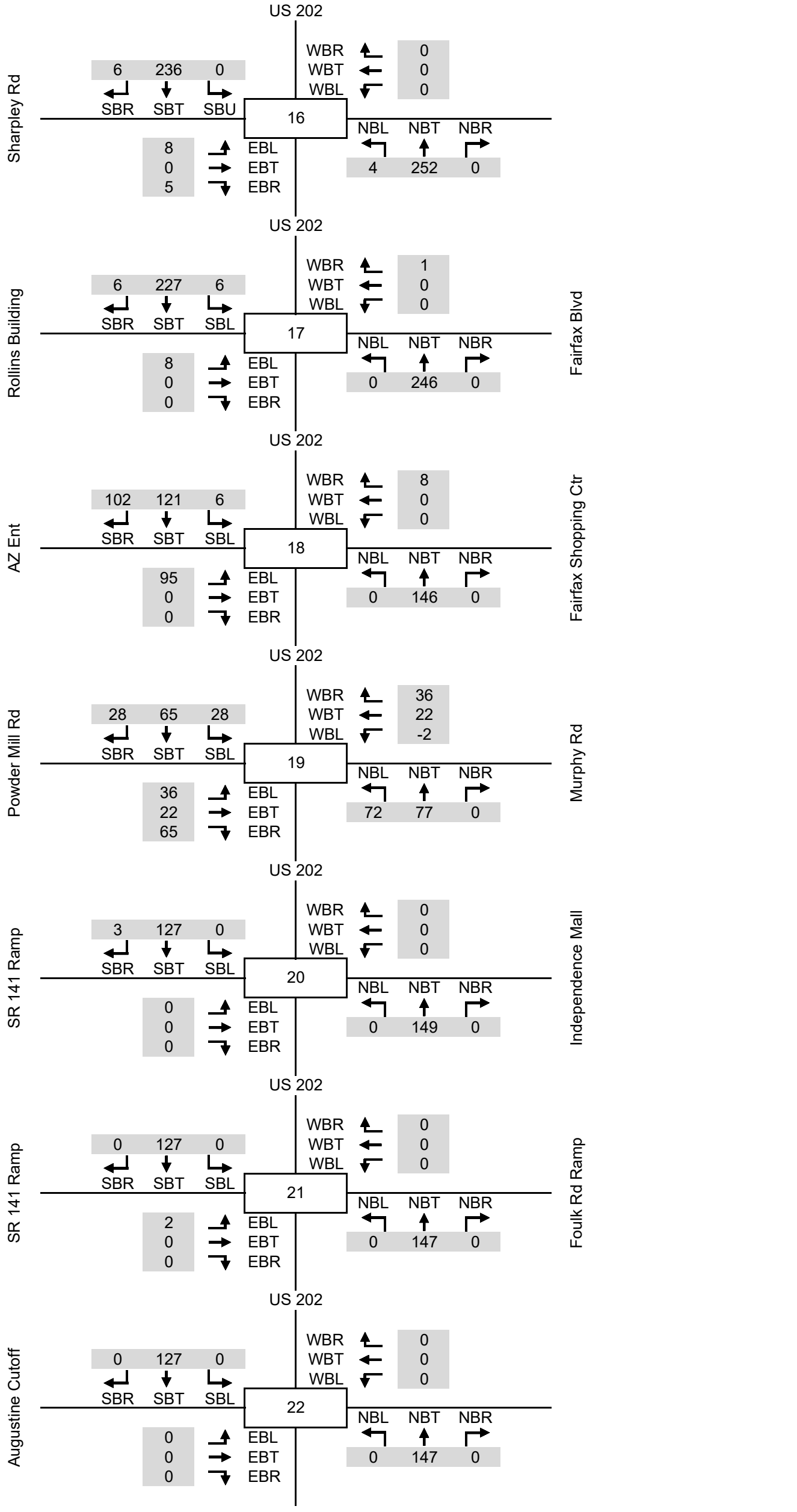

2050 By-right Development - PM Volume Growth

Exiting Transportation Infrastructure

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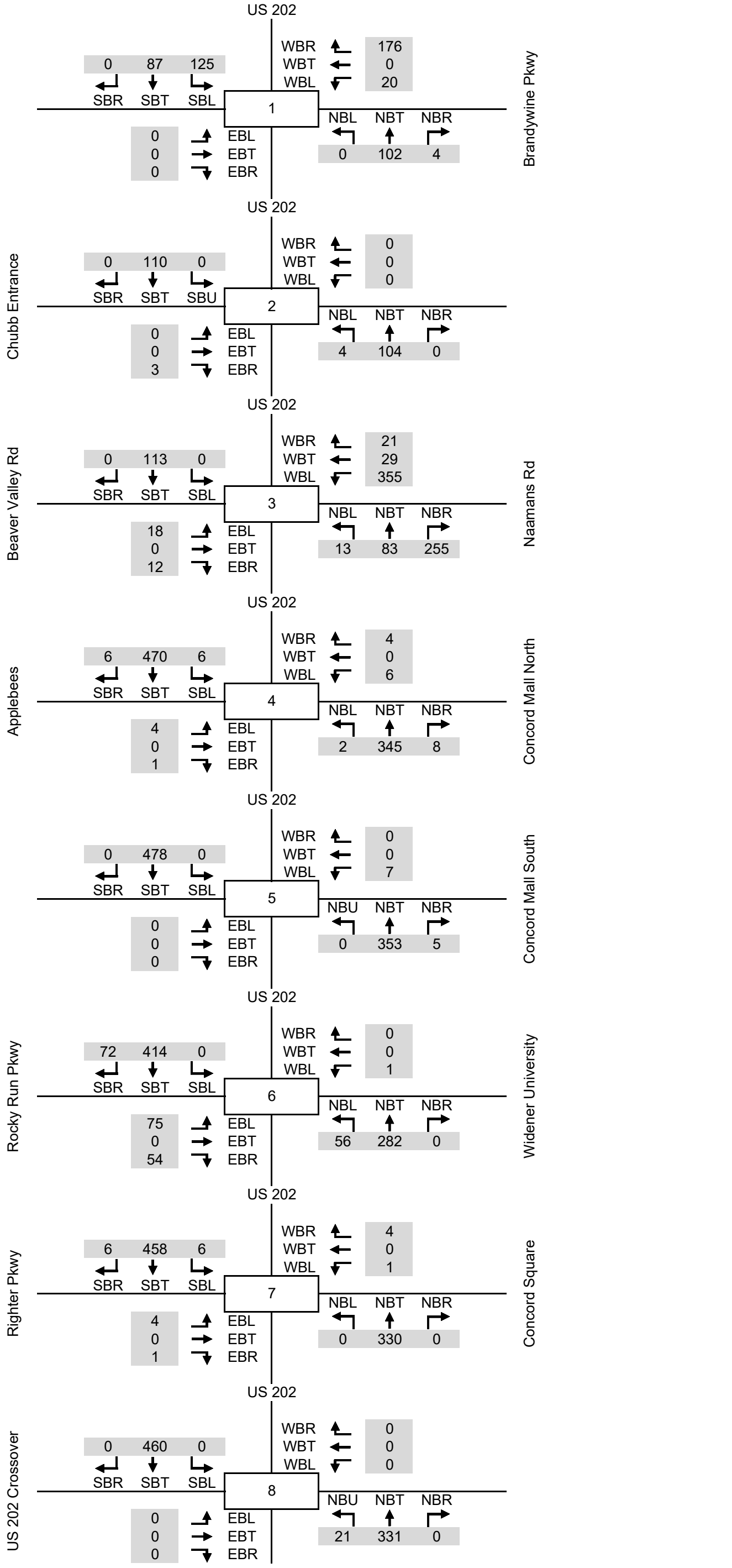
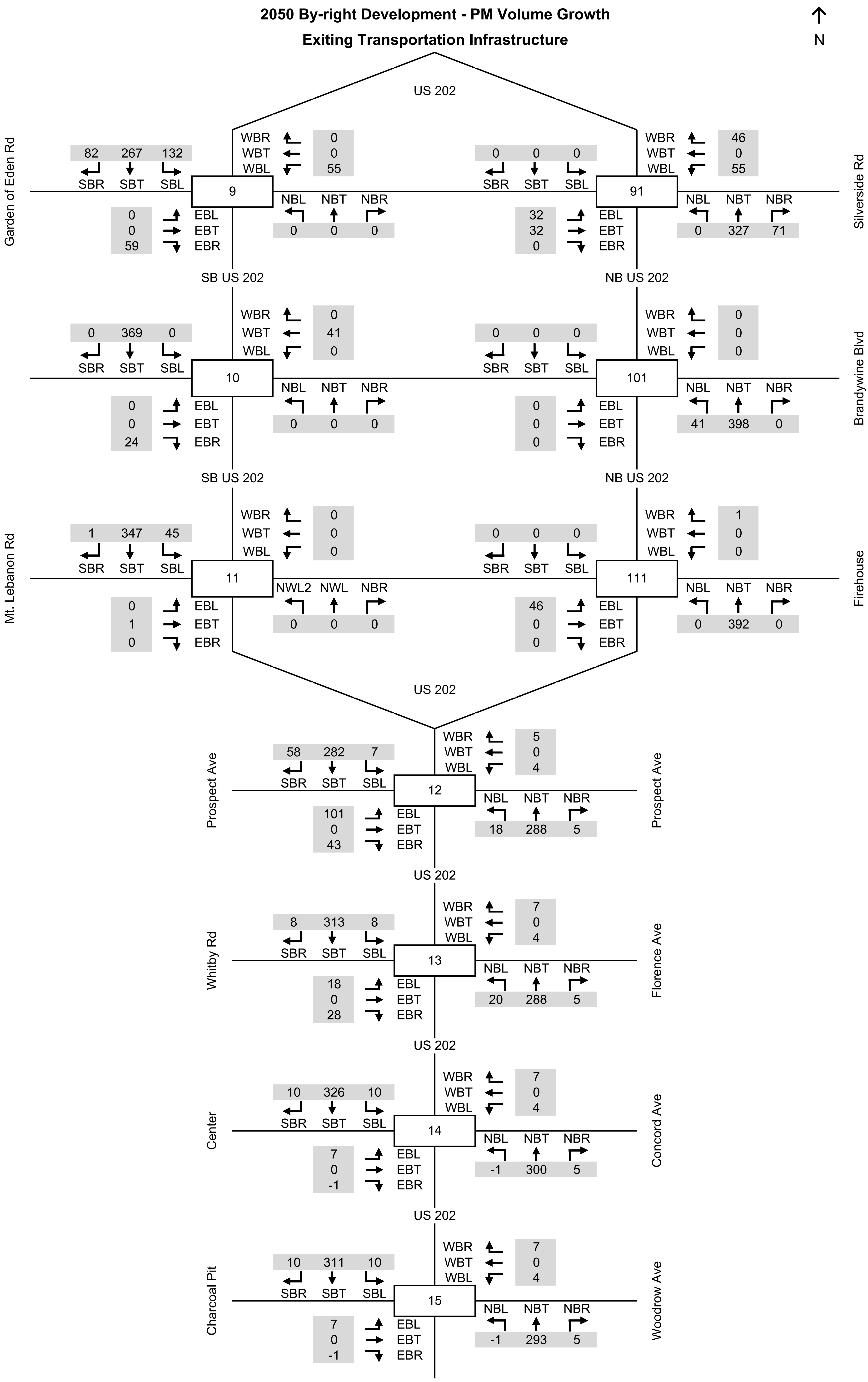


2050 By-right Development - PM Volume Growth

Exiting Transportation Infrastructure



2050 By-right Development - PM Volume Growth

Exiting Transportation Infrastructure

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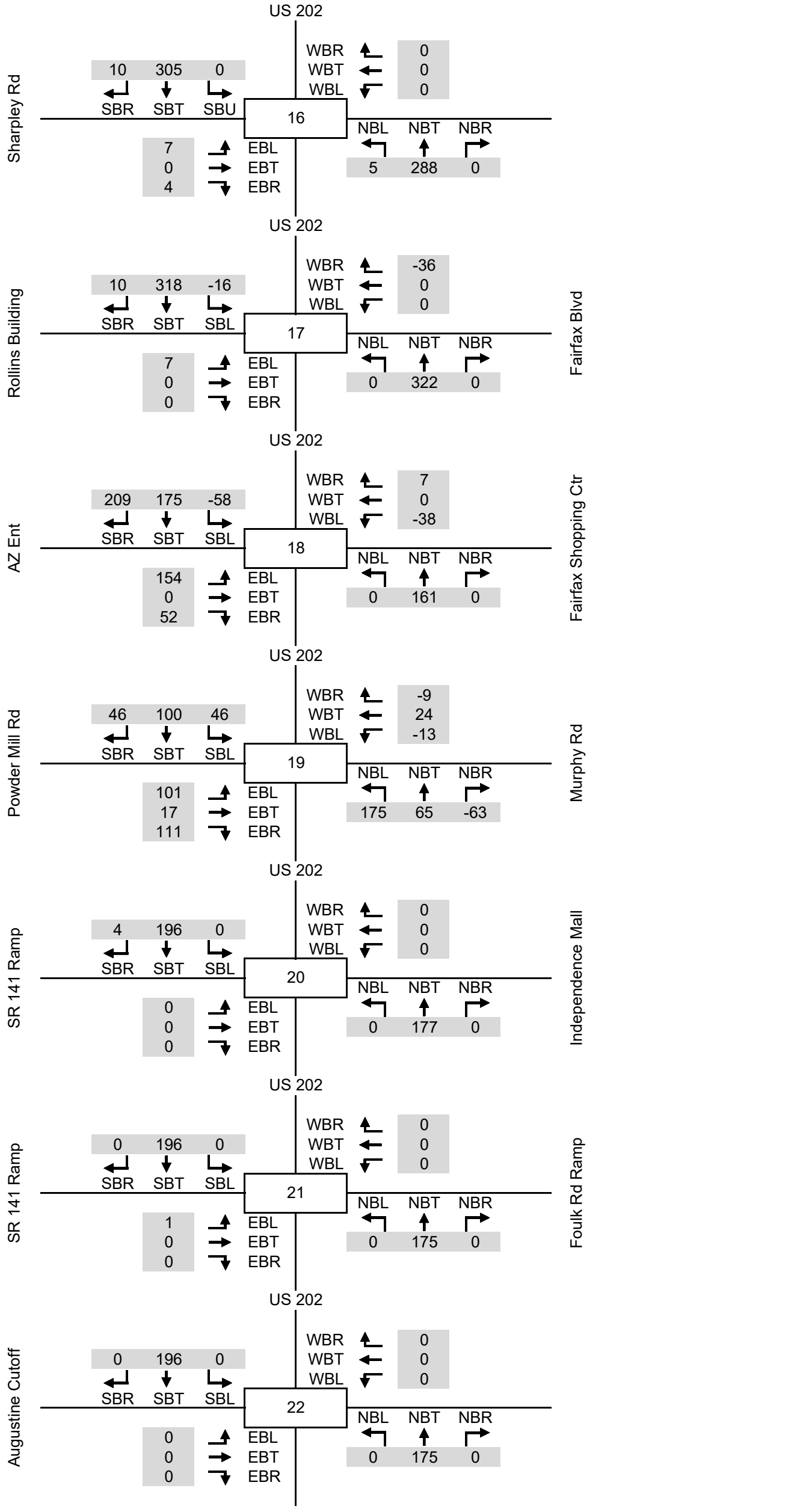

2050 By-right Development - AM Volume Growth

Additional Roadway Connections

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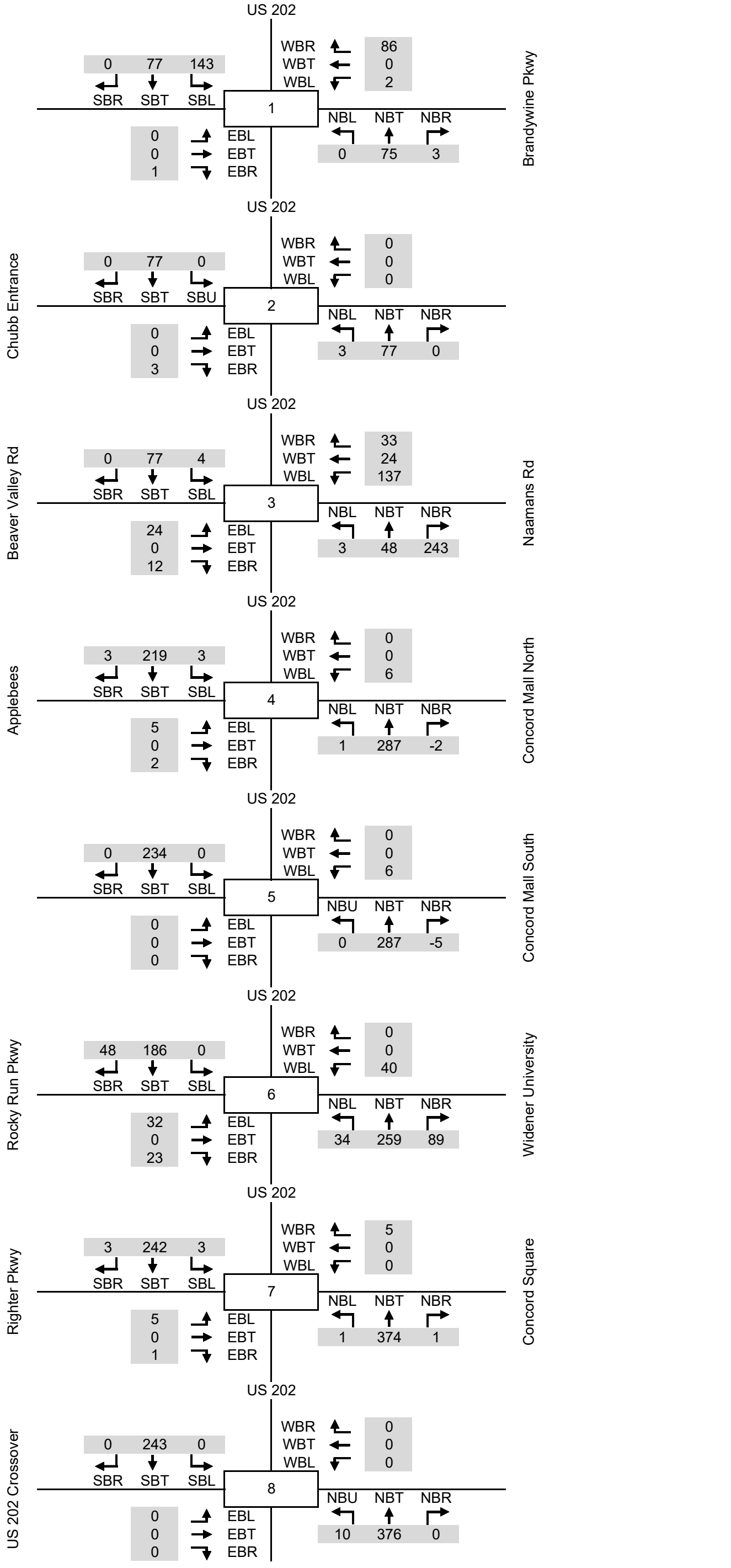

2050 By-right Development - AM Volume Growth

Additional Roadway Connections

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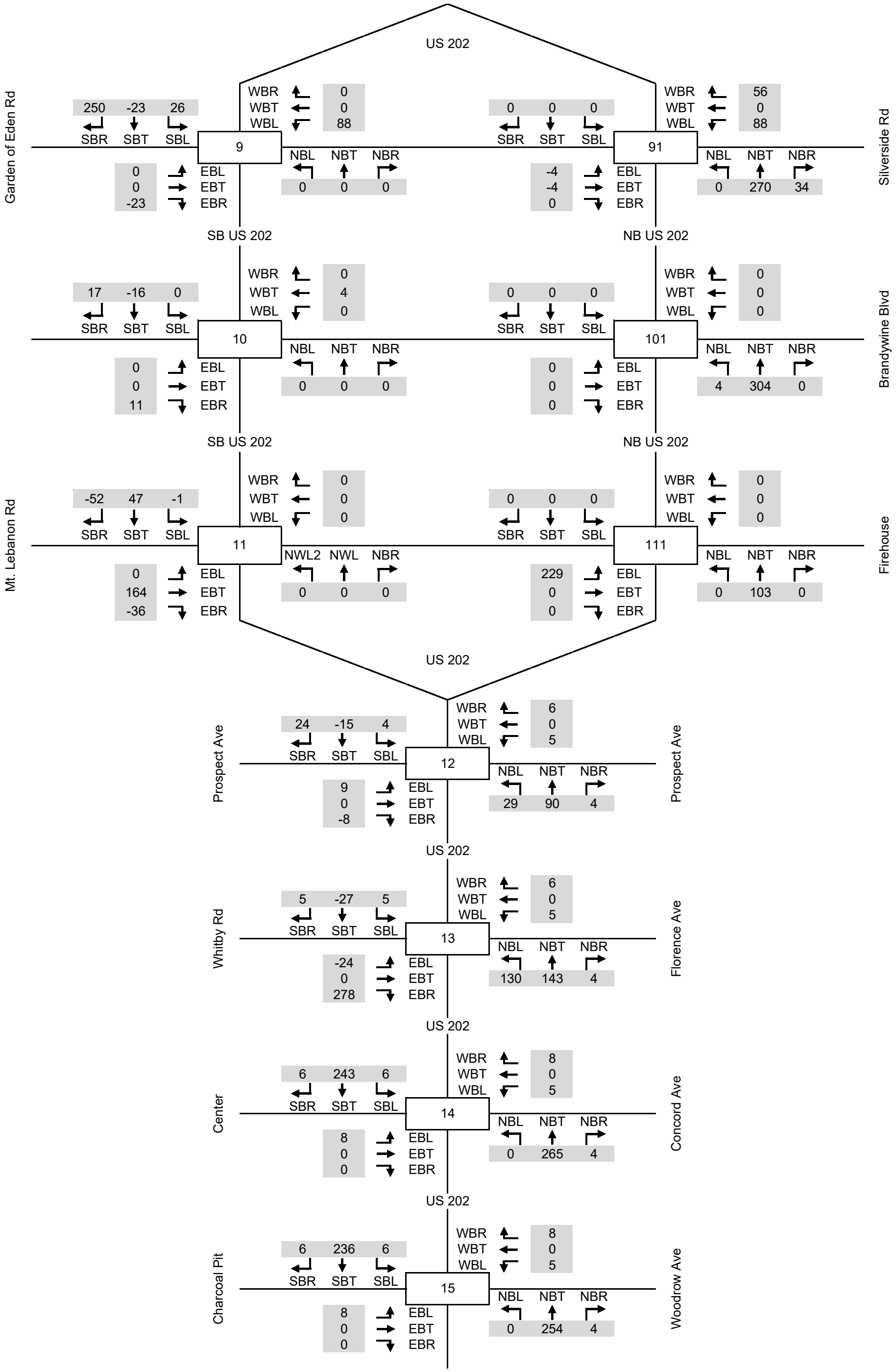

2050 By-right Development - AM Volume Growth

Additional Roadway Connections

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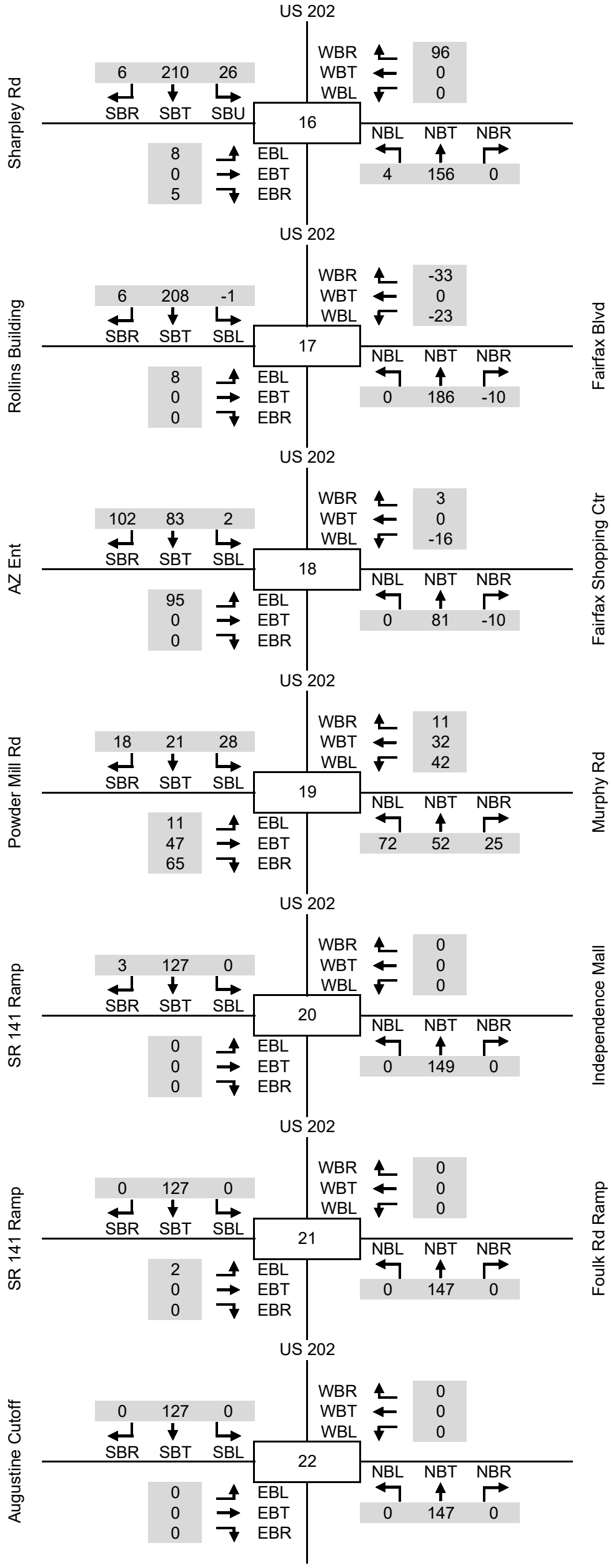

2050 By-right Development - PM Volume Growth

Additional Roadway Connections

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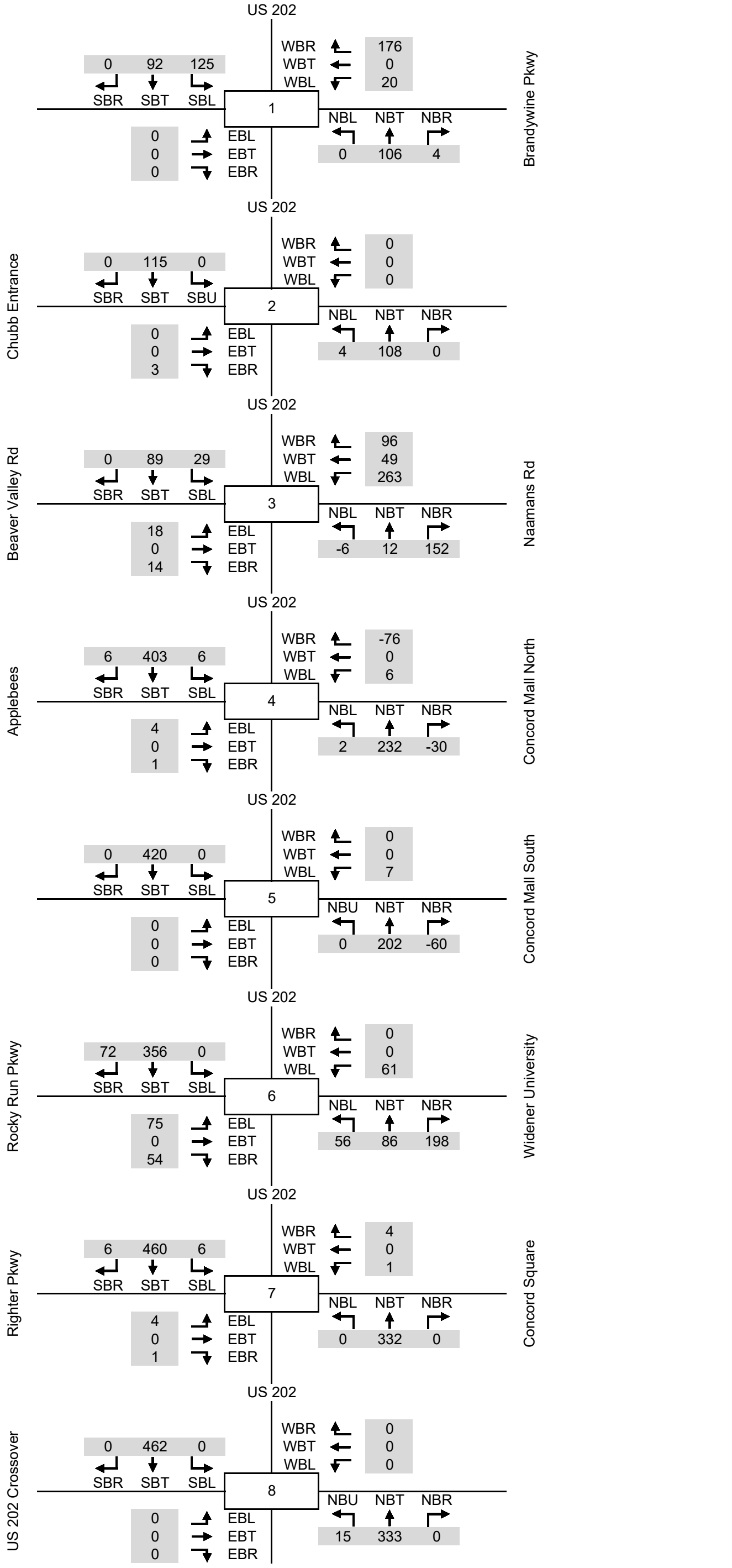

2050 By-right Development - PM Volume Growth

Additional Roadway Connections

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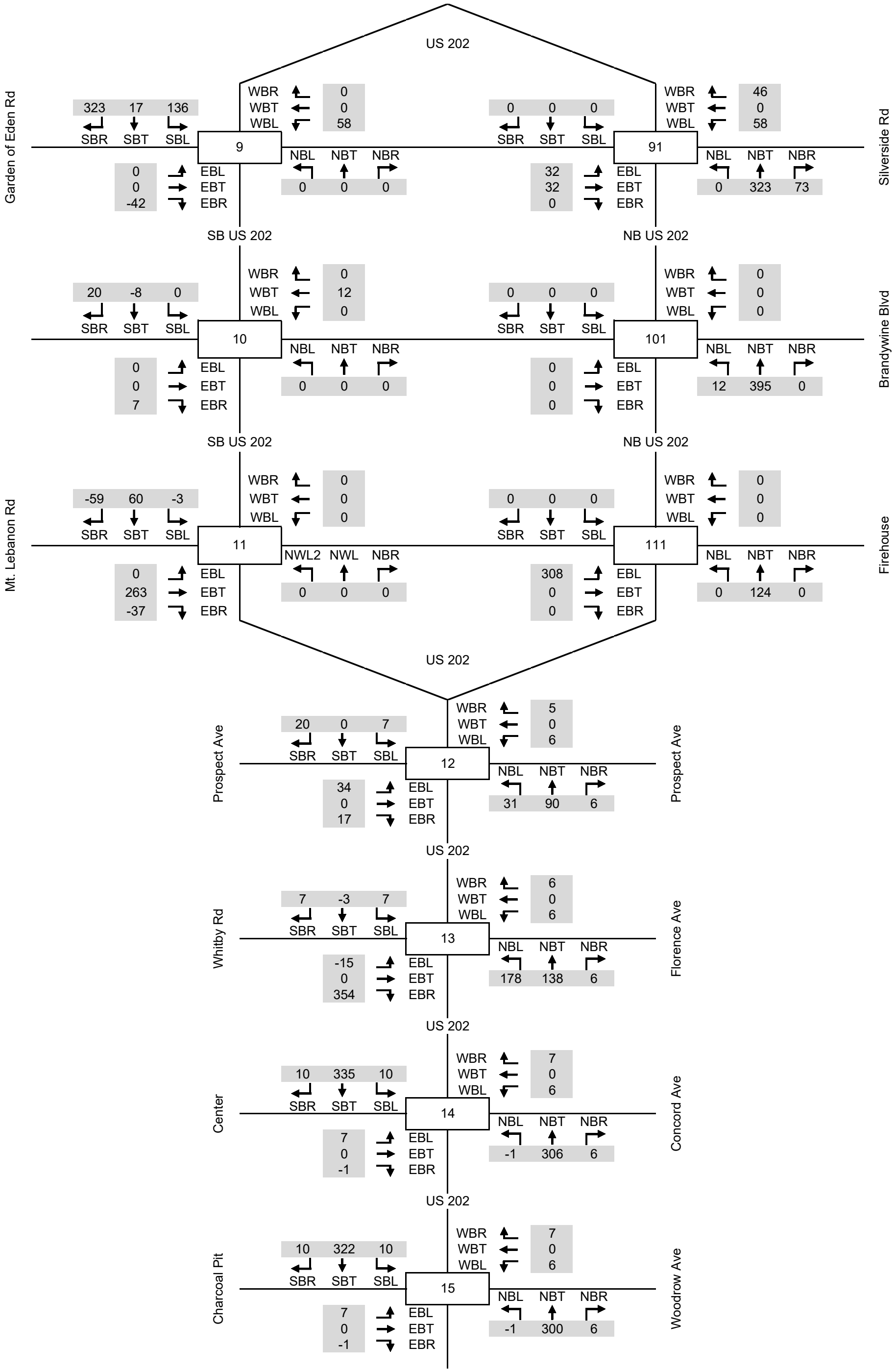

2050 By-right Development - PM Volume Growth

Additional Roadway Connections

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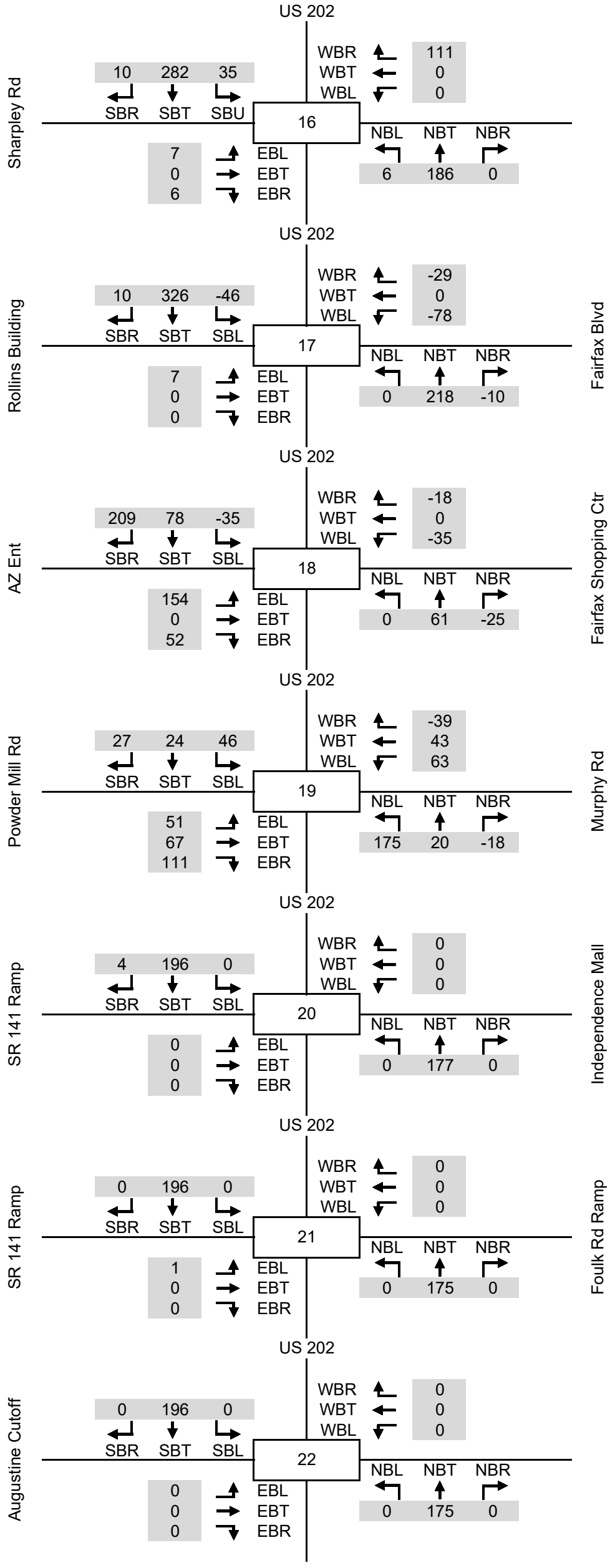

2050 By-right Development - AM Volume Growth

Additional Roadway and Ped/Bike Connections

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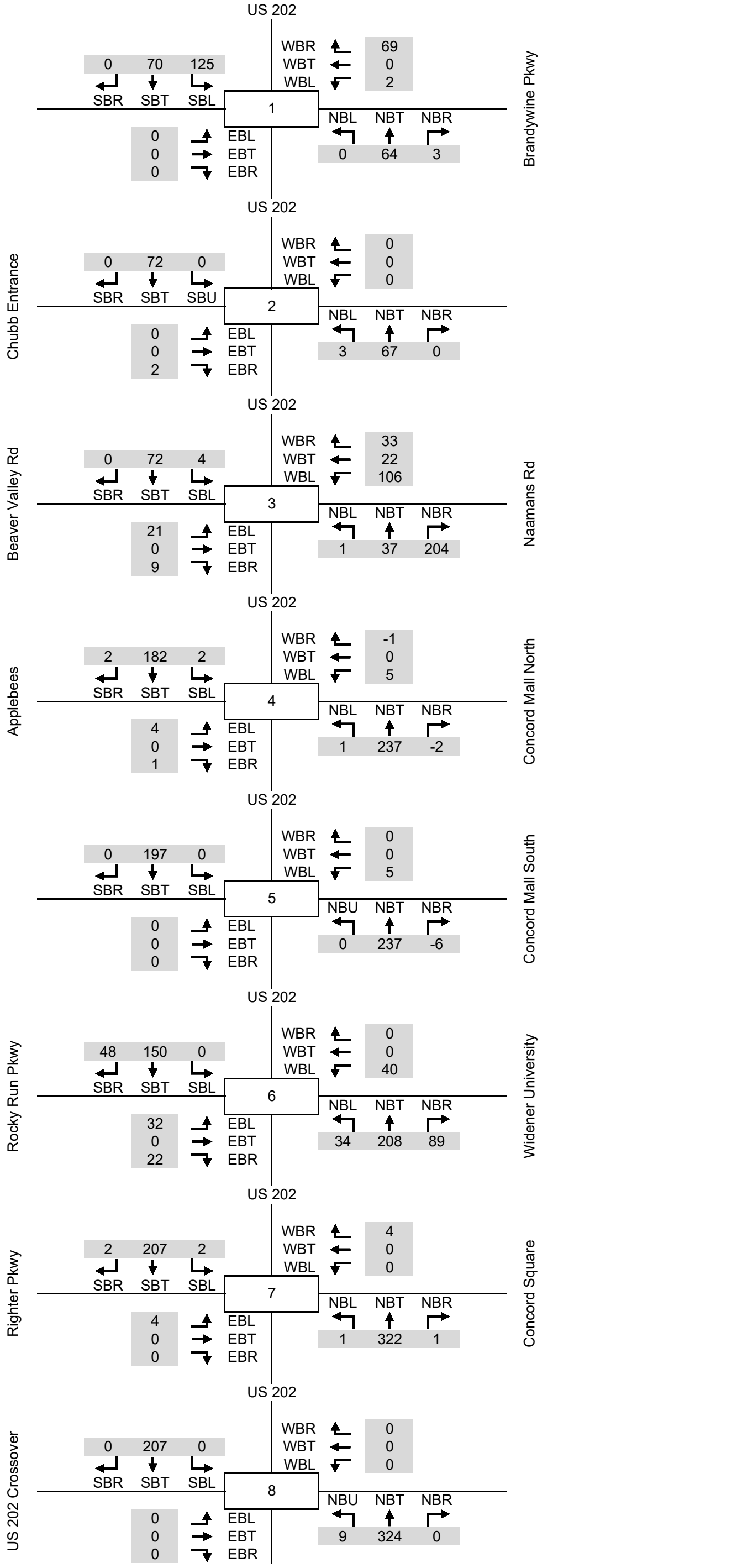

2050 By-right Development - AM Volume Growth

Additional Roadway and Ped/Bike Connections

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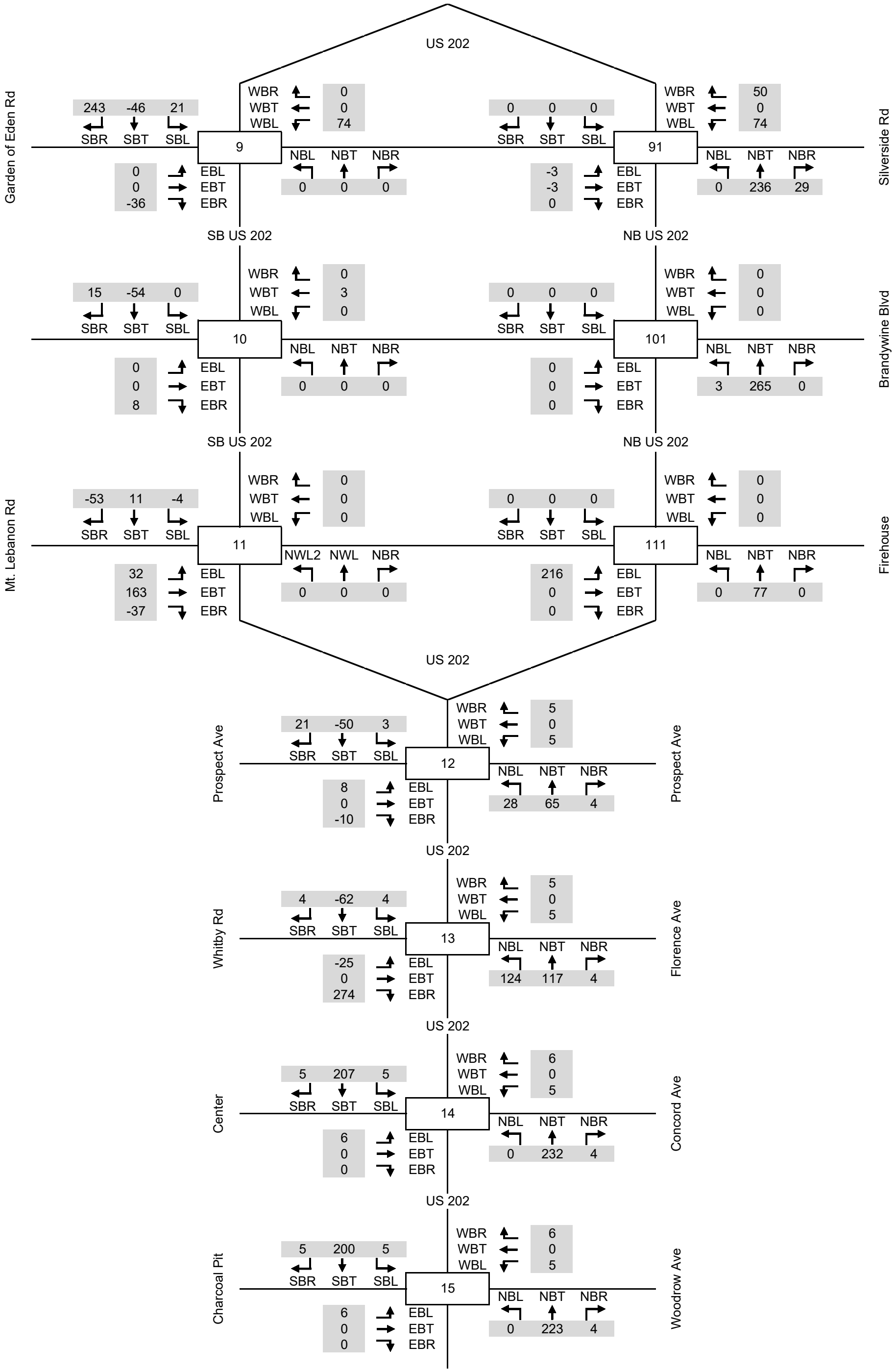

2050 By-right Development - AM Volume Growth

Additional Roadway and Ped/Bike Connections

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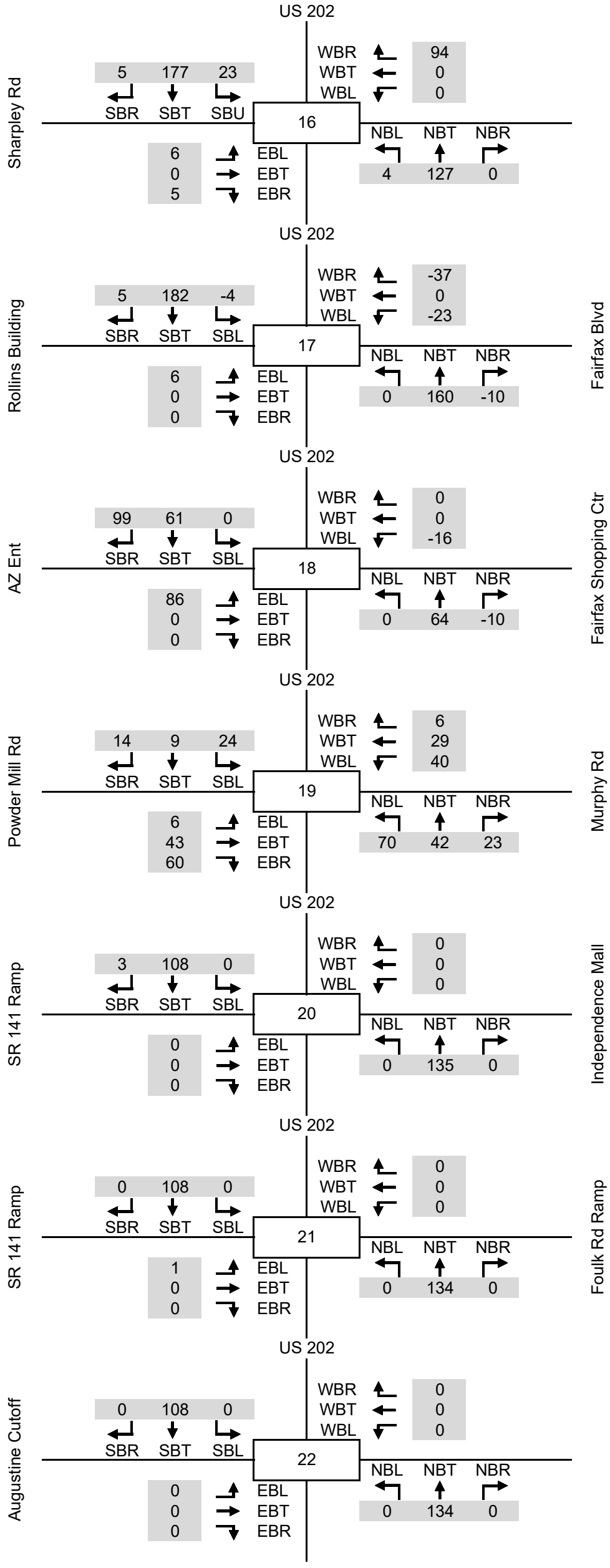

2050 By-right Development - PM Volume Growth

Additional Roadway and Ped/Bike Connections

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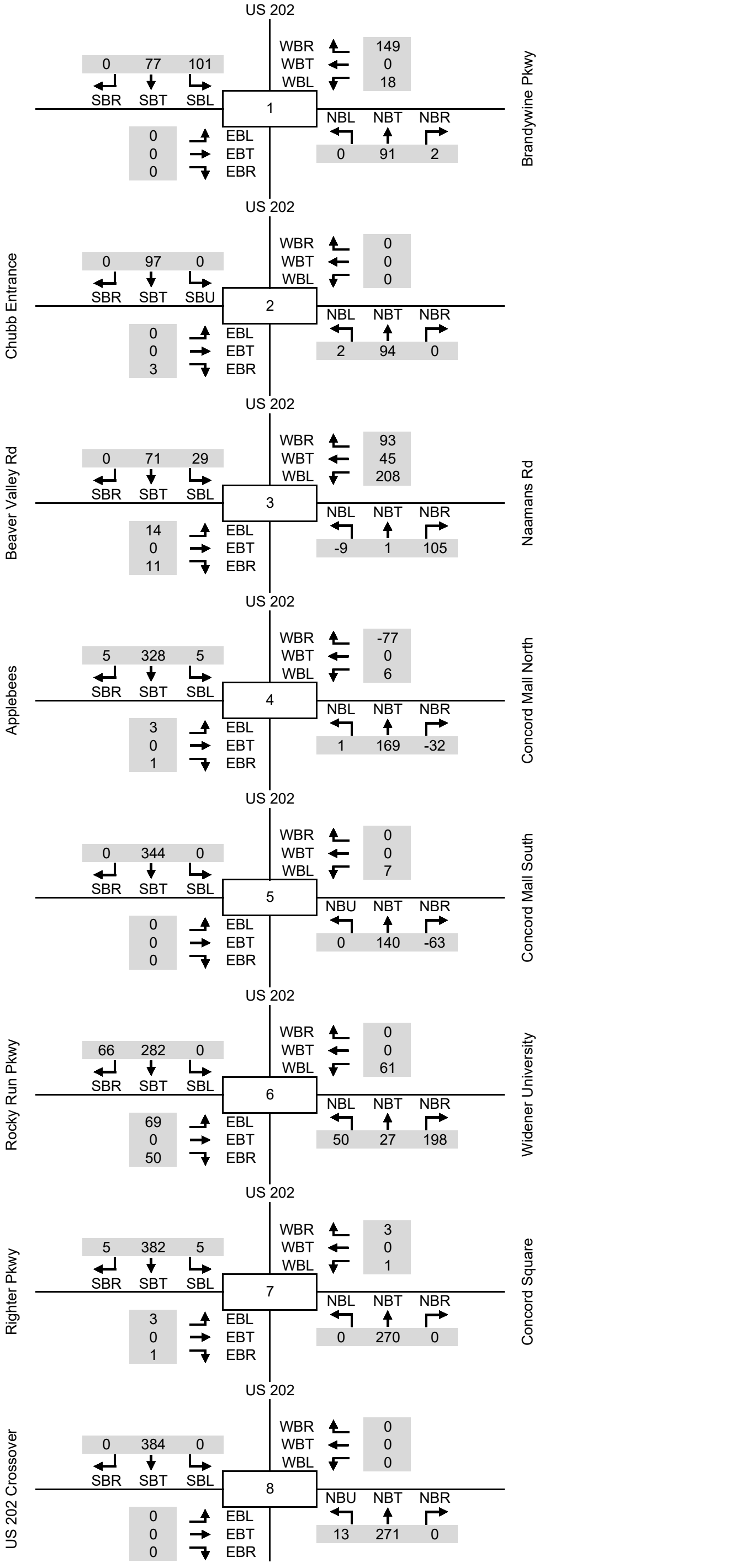

2050 By-right Development - PM Volume Growth

Additional Roadway and Ped/Bike Connections

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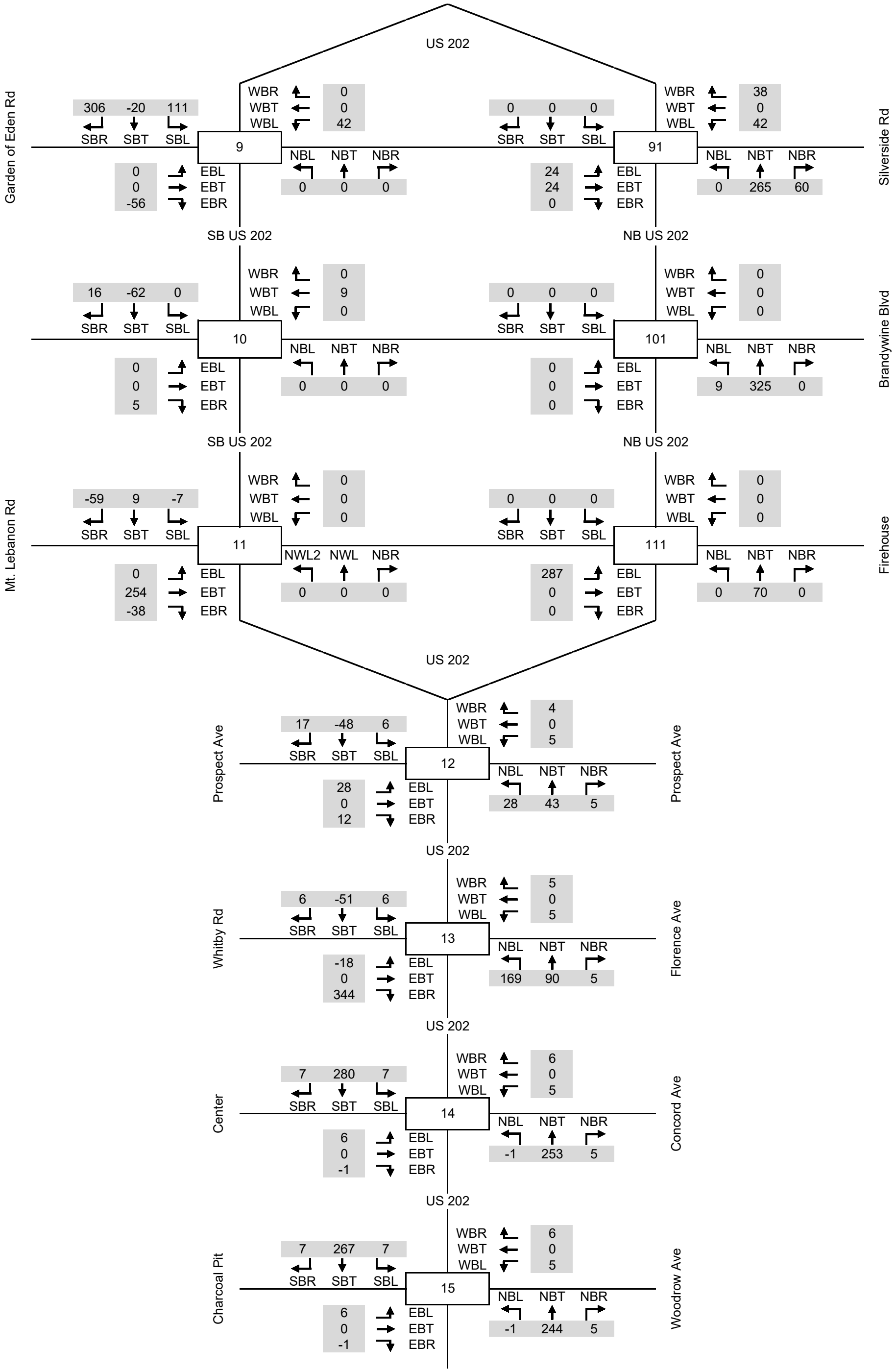

2050 By-right Development - PM Volume Growth

Additional Roadway and Ped/Bike Connections

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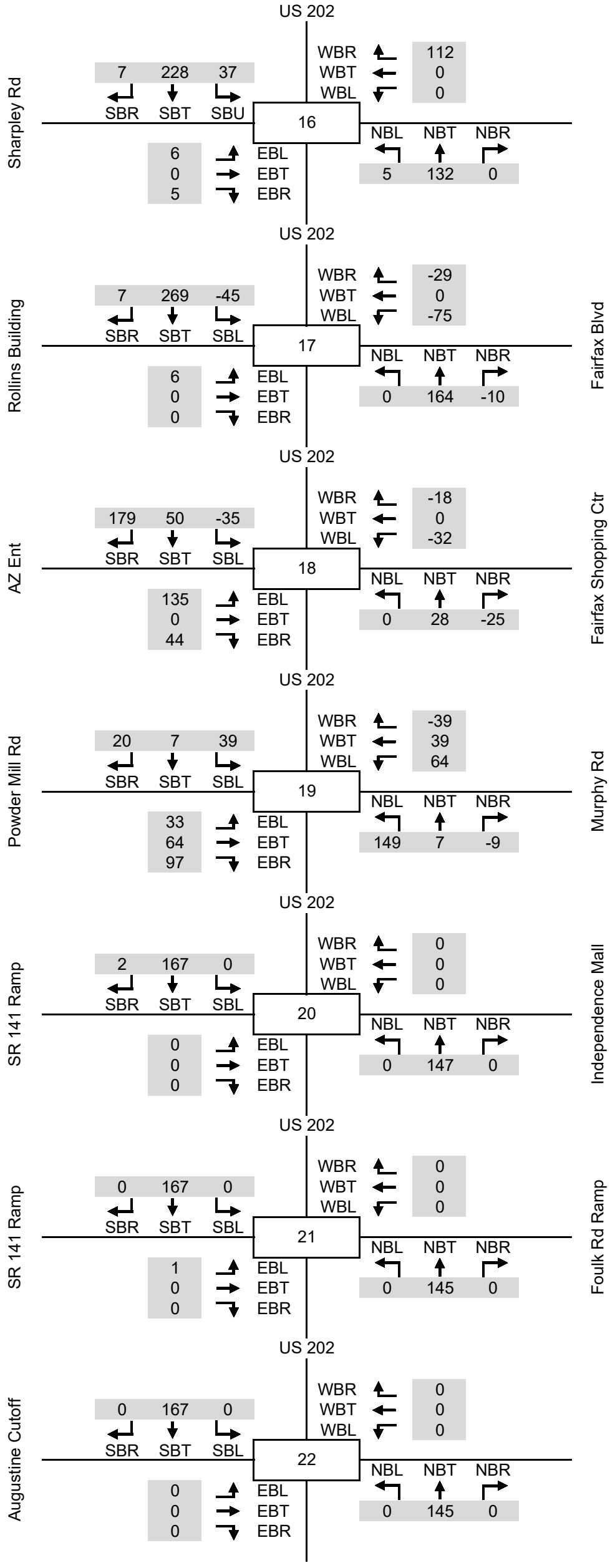

2050 Proposed Zoning Low - AM Volume Growth

Exiting Transportation Infrastructure

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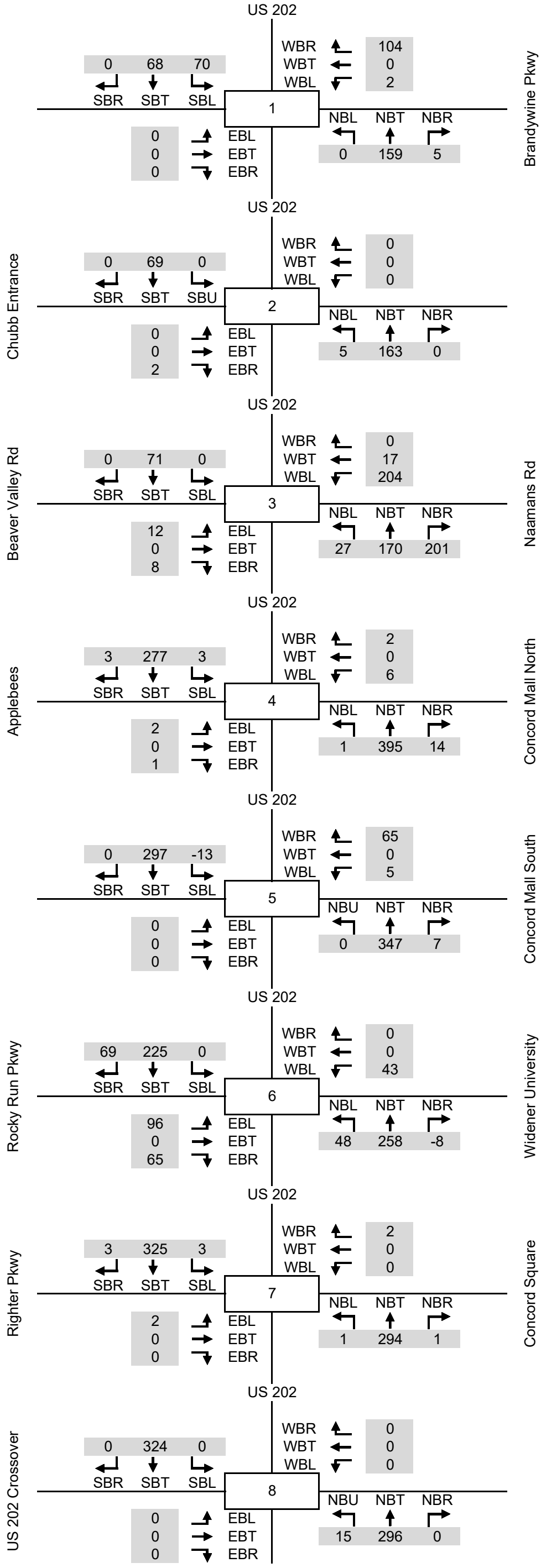

2050 Proposed Zoning Low - AM Volume Growth

Exiting Transportation Infrastructure

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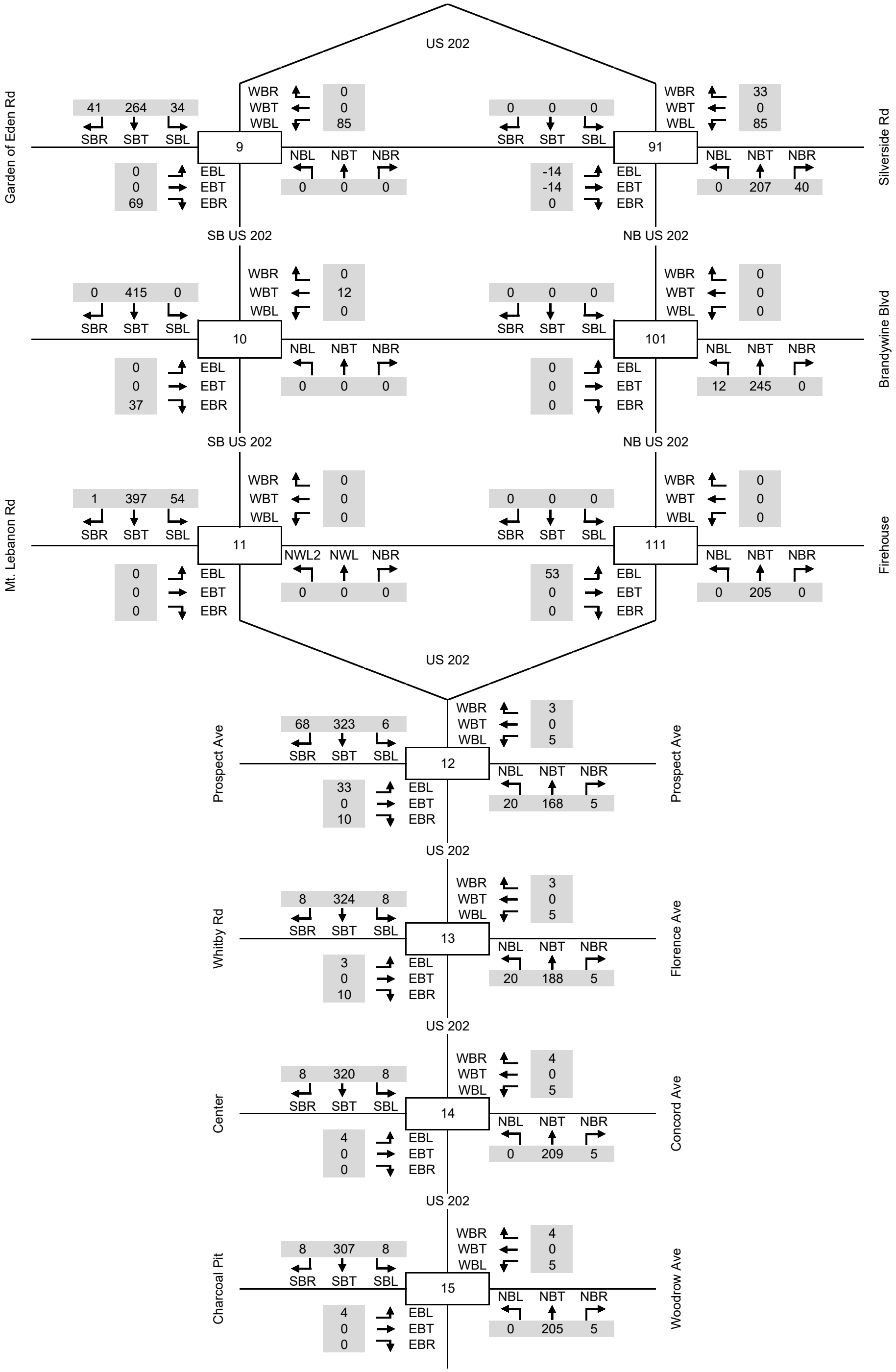

2050 Proposed Zoning Low - AM Volume Growth

Exiting Transportation Infrastructure

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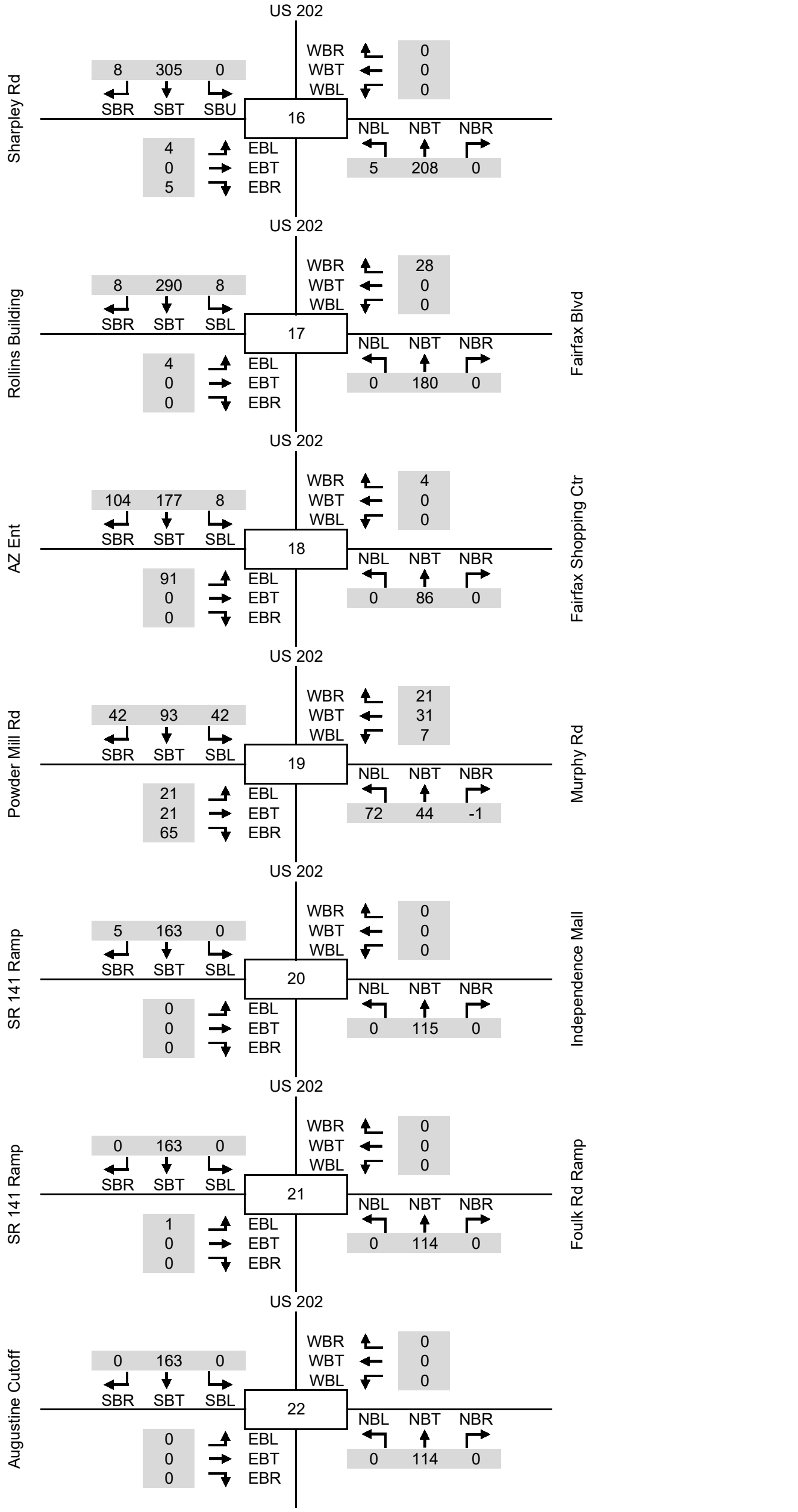

2050 Proposed Zoning Low - PM Volume Growth

Exiting Transportation Infrastructure

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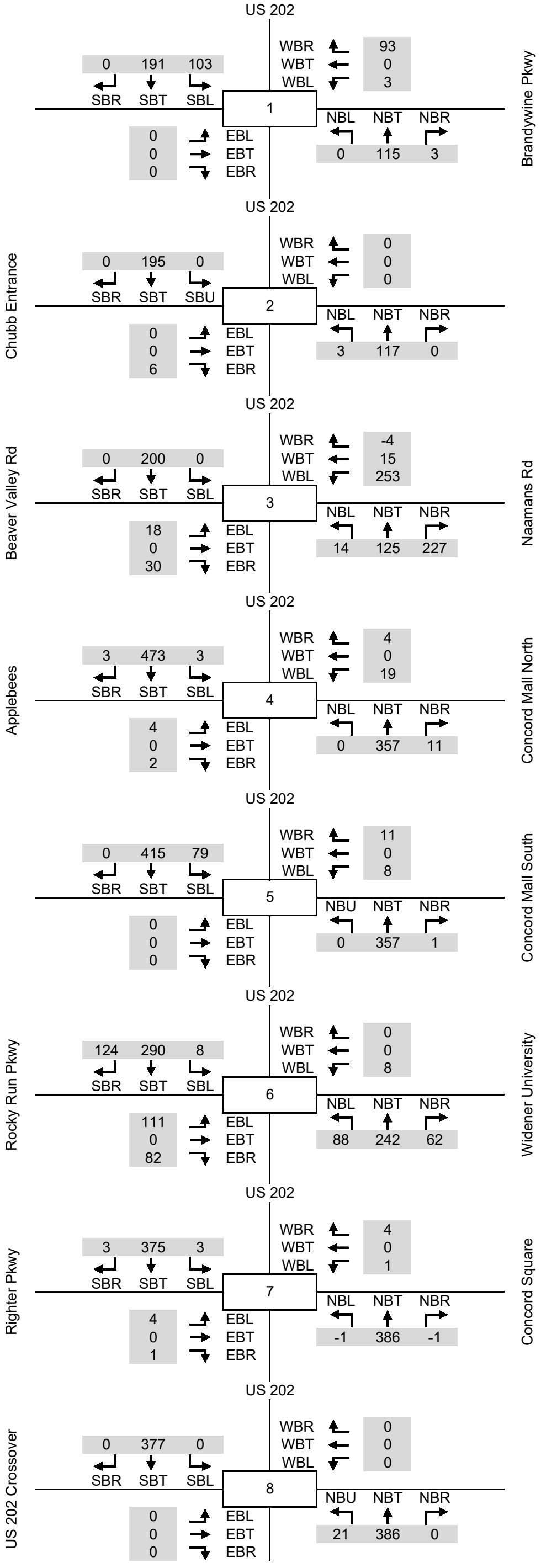

2050 Proposed Zoning Low - PM Volume Growth

Exiting Transportation Infrastructure

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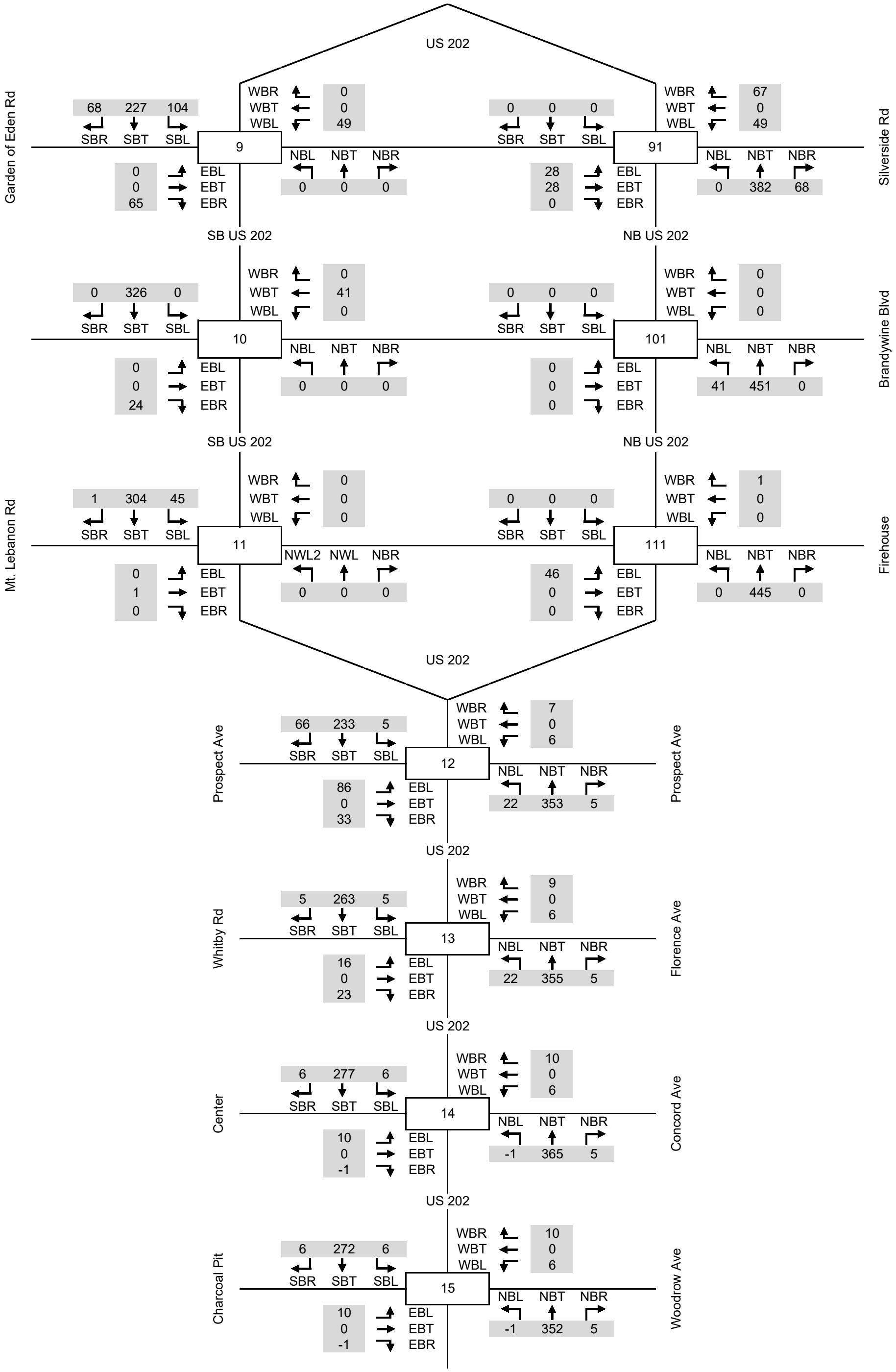

2050 Proposed Zoning Low - PM Volume Growth

Exiting Transportation Infrastructure

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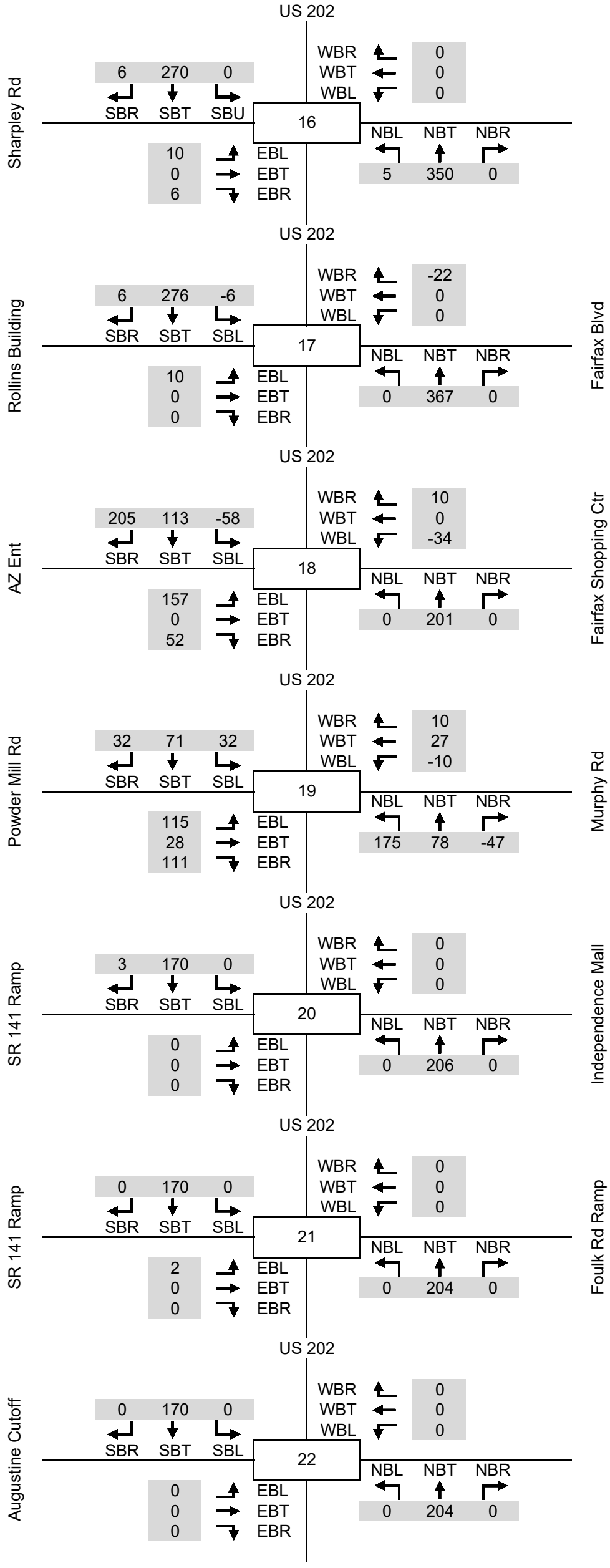

2050 Proposed Zoning Low - AM Volume Growth

Additional Roadway Connections

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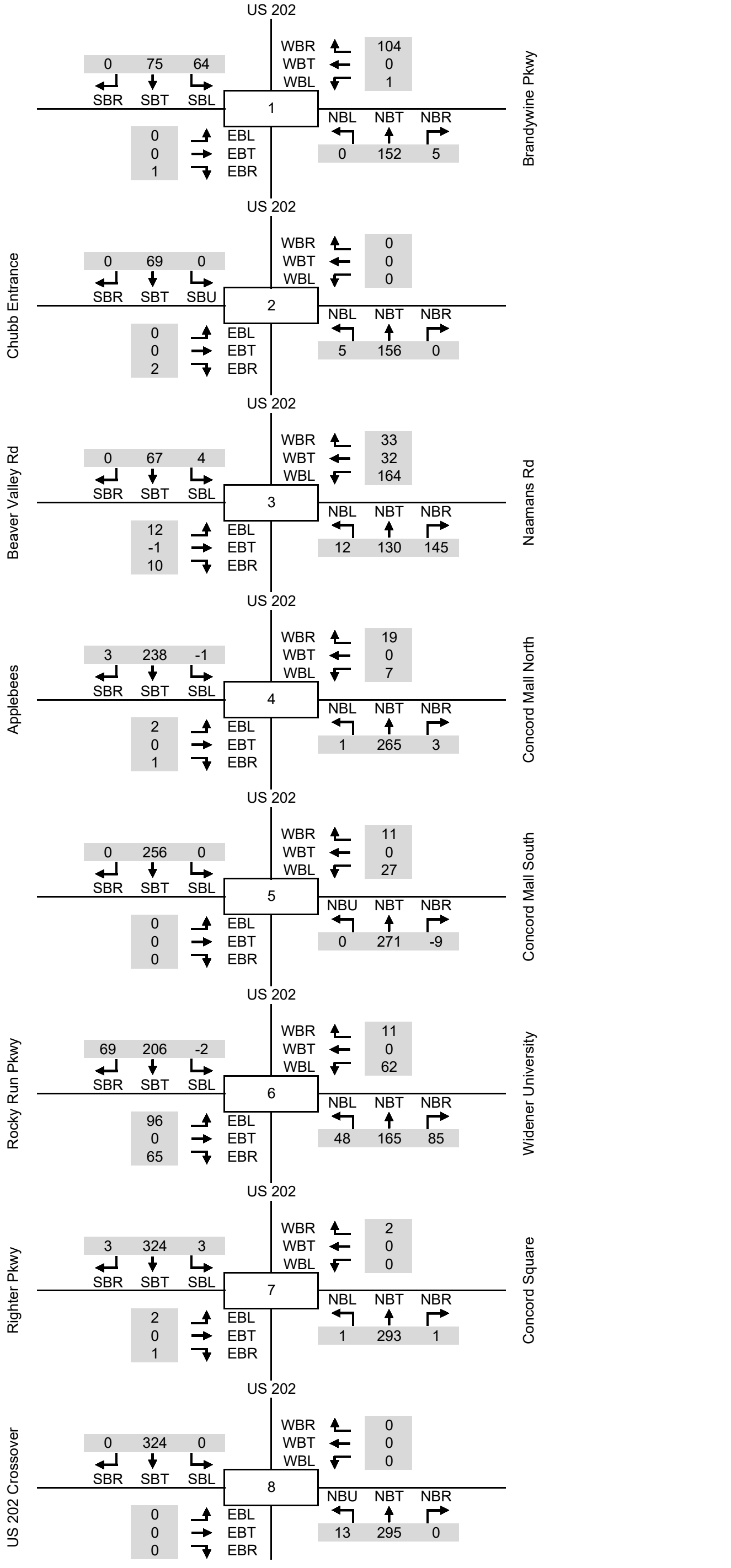

2050 Proposed Zoning Low - AM Volume Growth

Additional Roadway Connections

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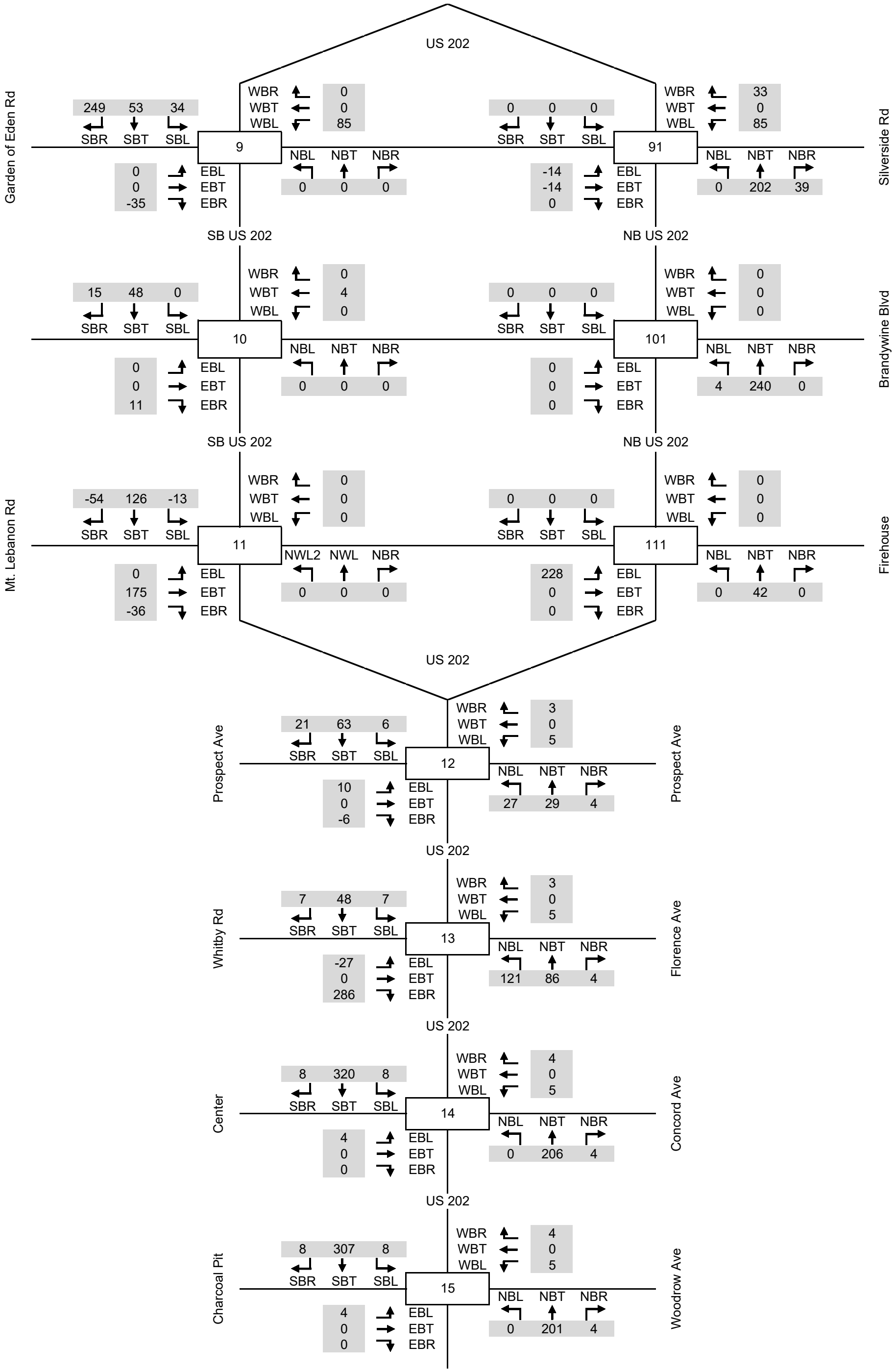

2050 Proposed Zoning Low - AM Volume Growth

Additional Roadway Connections

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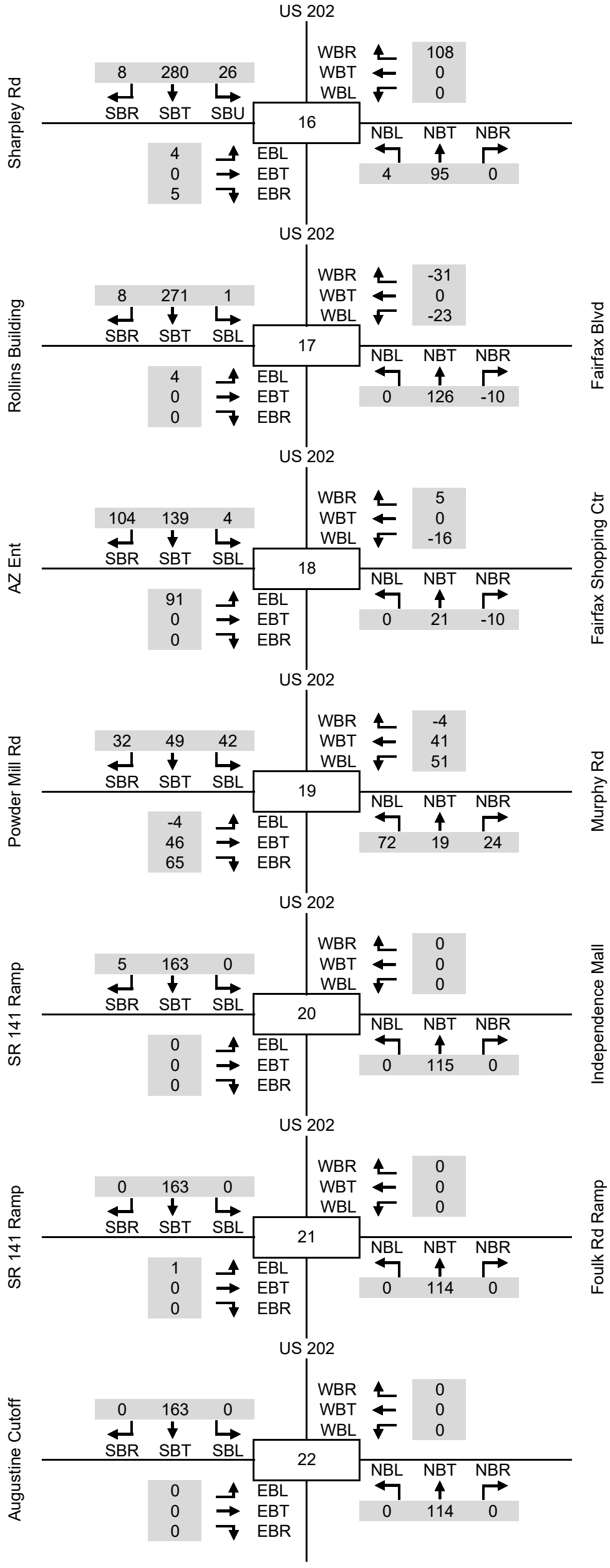

2050 Proposed Zoning Low - PM Volume Growth

Additional Roadway Connections

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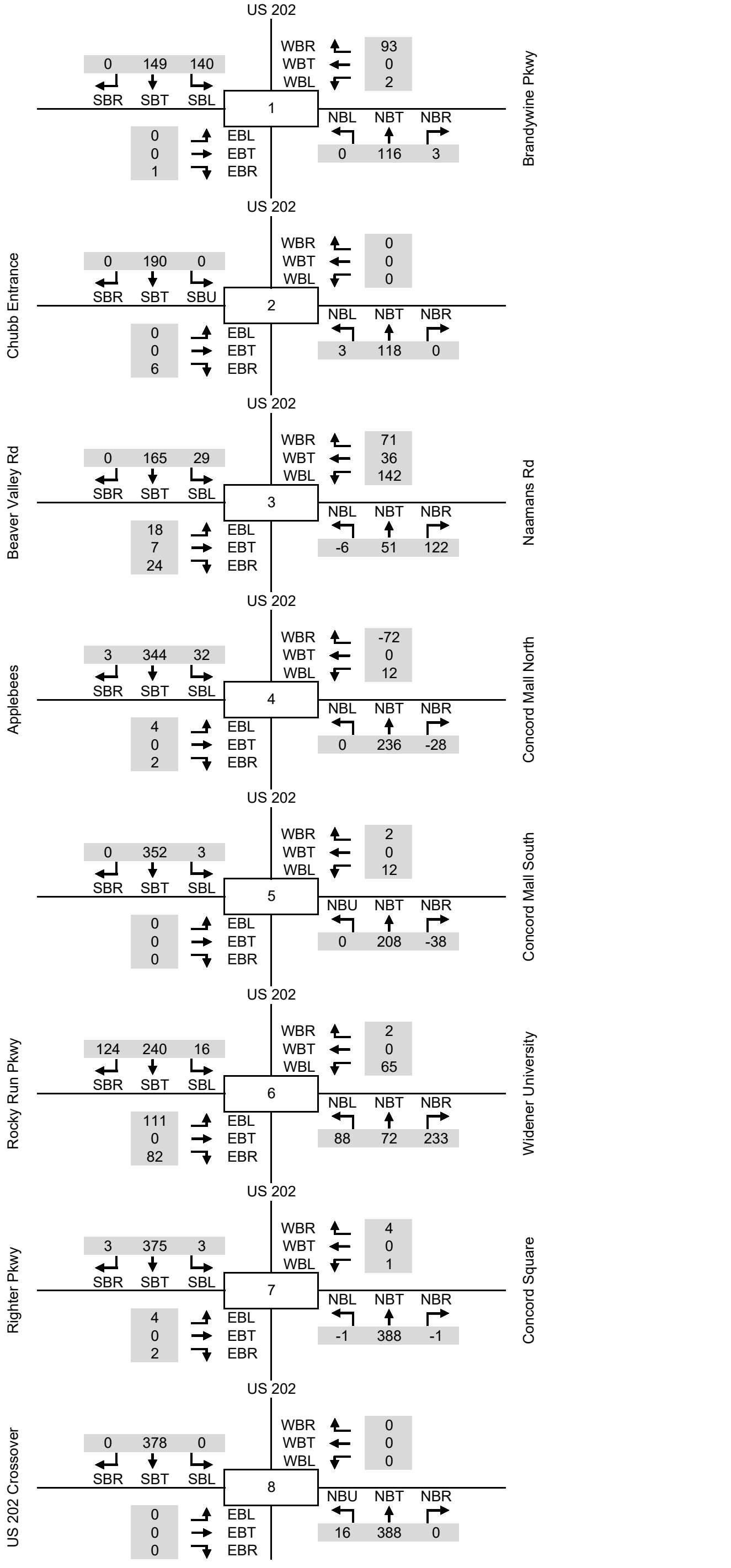

2050 Proposed Zoning Low - PM Volume Growth

Additional Roadway Connections

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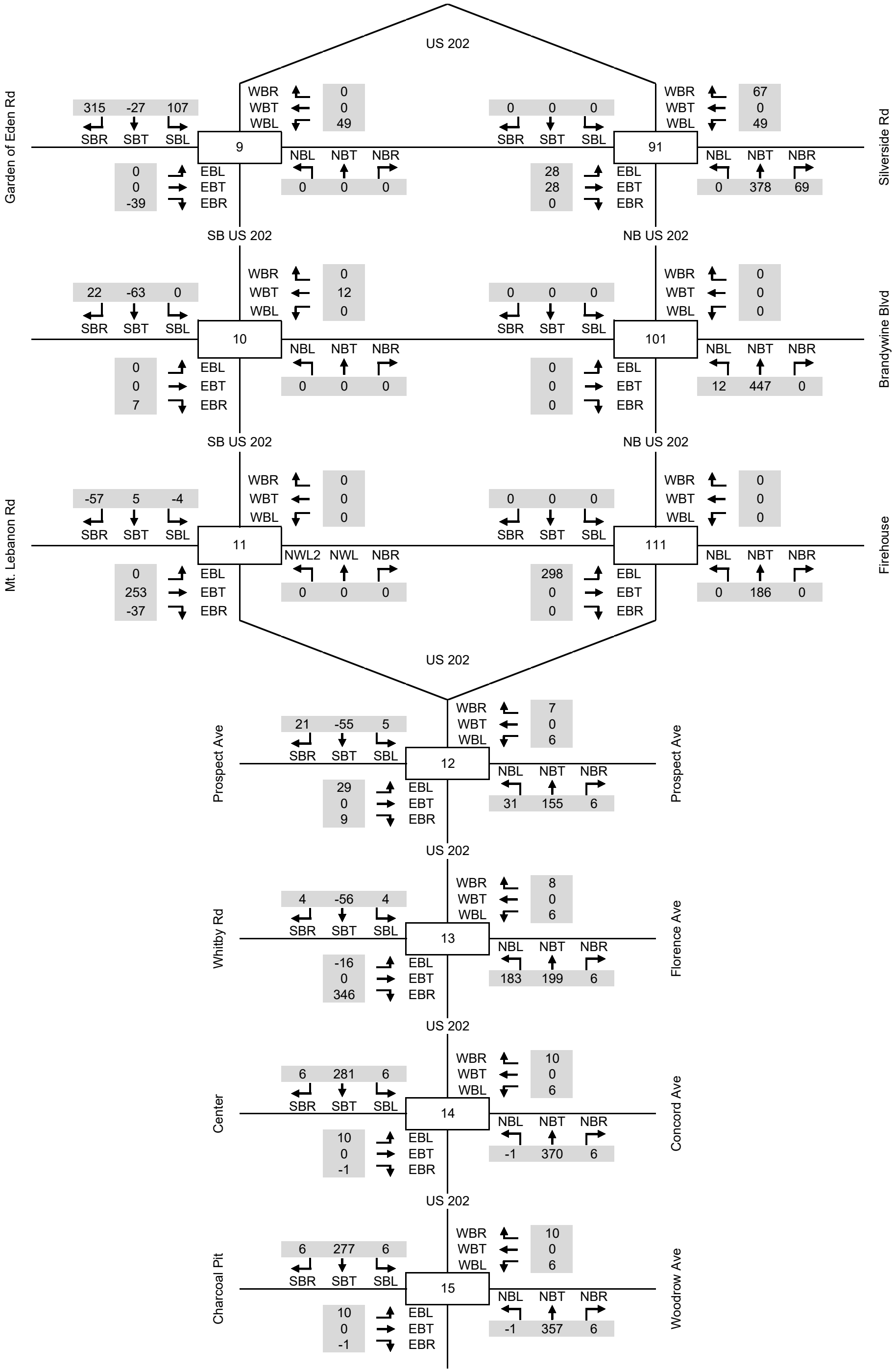

2050 Proposed Zoning Low - PM Volume Growth

Additional Roadway Connections

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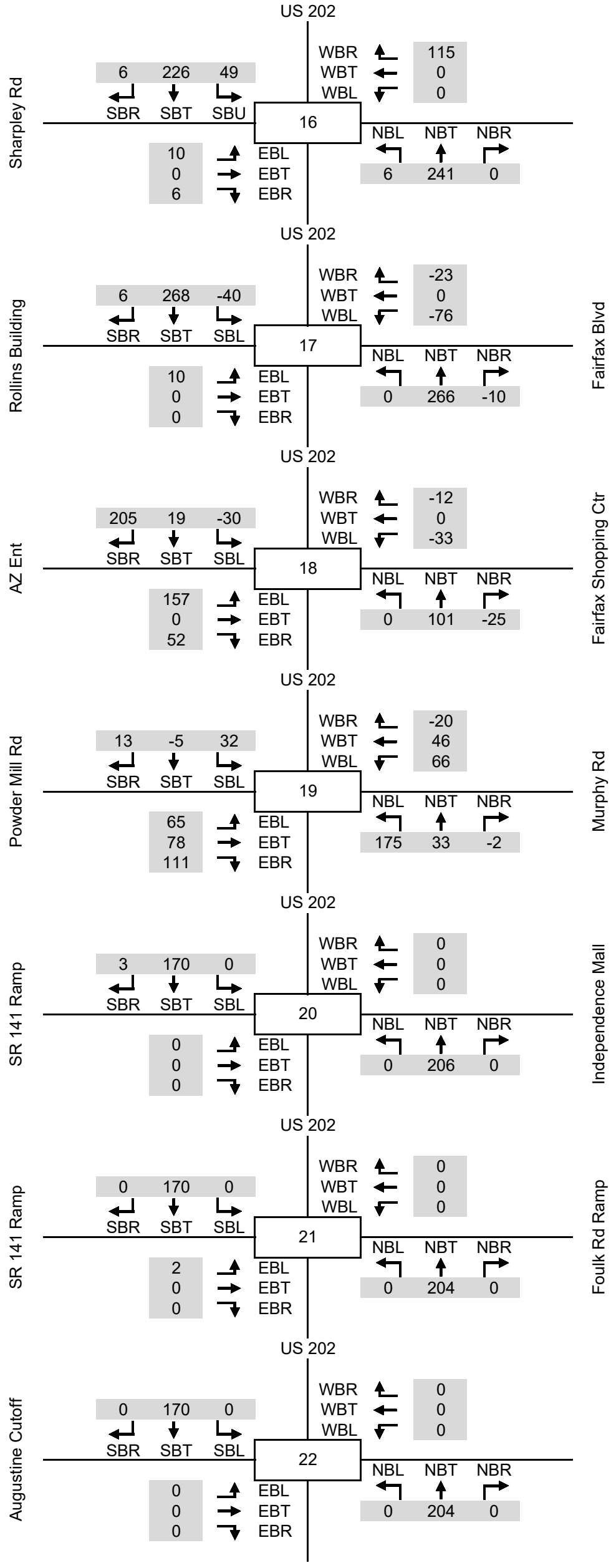

2050 Proposed Zoning Low - AM Volume Growth

Additional Roadway and Ped/Bike Connections

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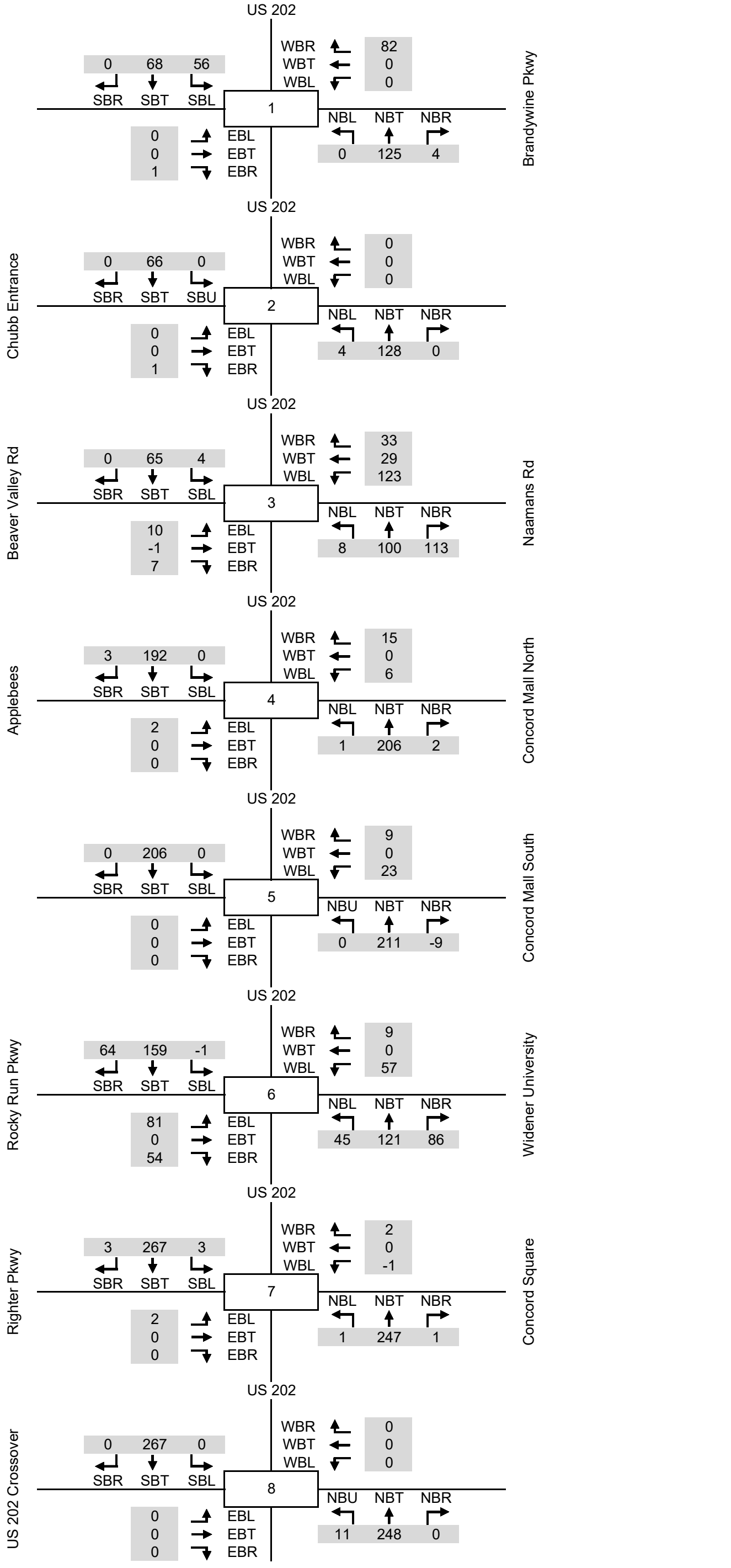

2050 Proposed Zoning Low - AM Volume Growth

Additional Roadway and Ped/Bike Connections

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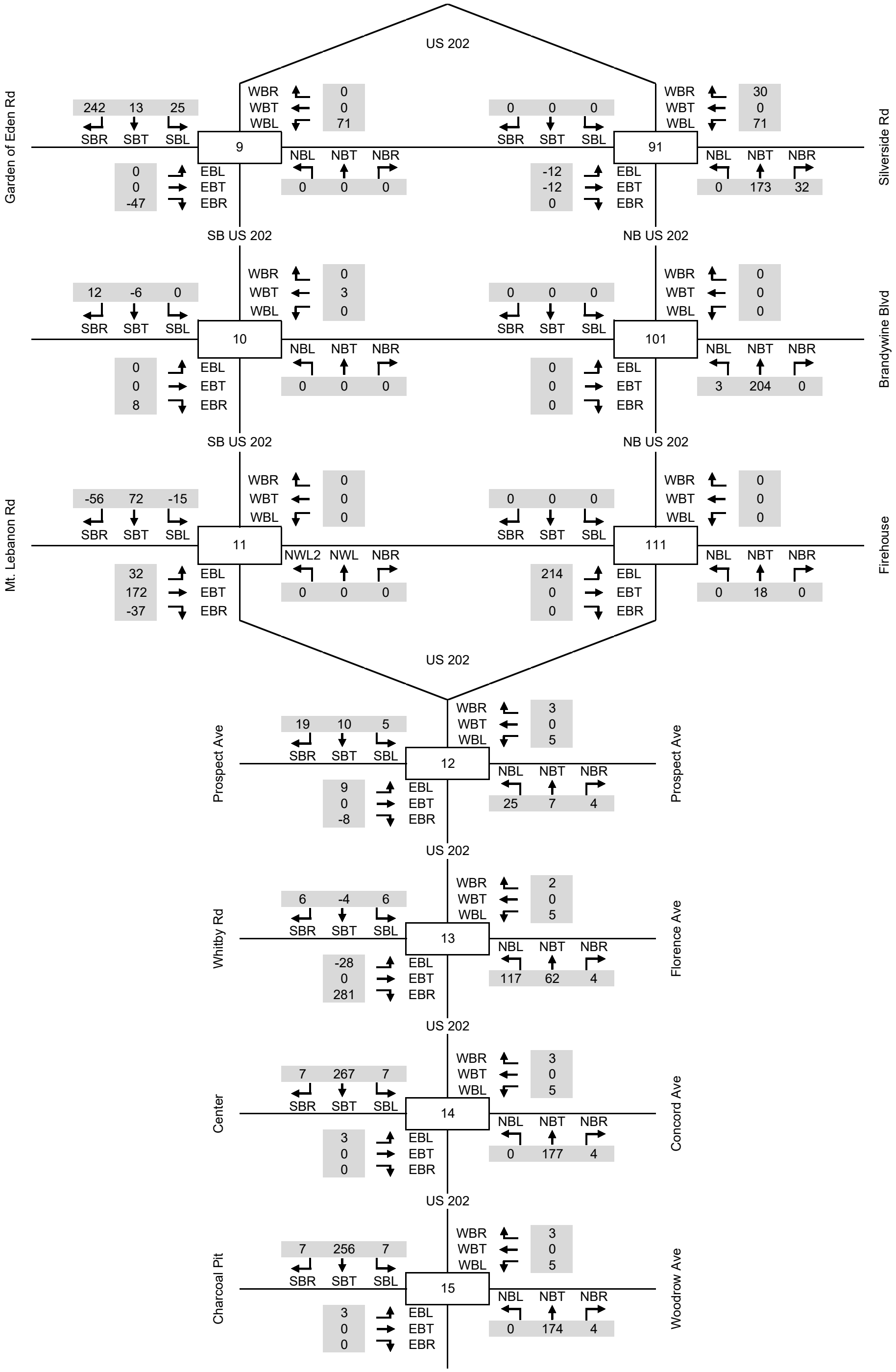

2050 Proposed Zoning Low - AM Volume Growth

Additional Roadway and Ped/Bike Connections

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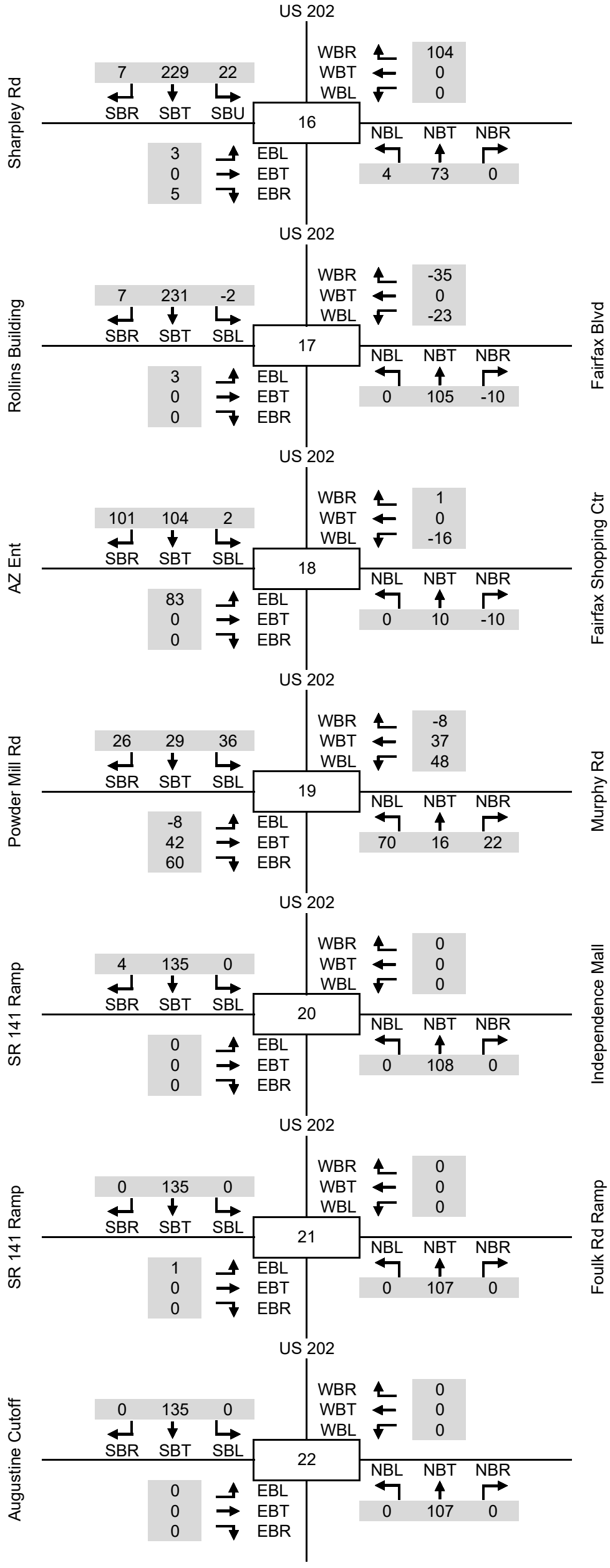

2050 Proposed Zoning Low - PM Volume Growth

Additional Roadway and Ped/Bike Connections

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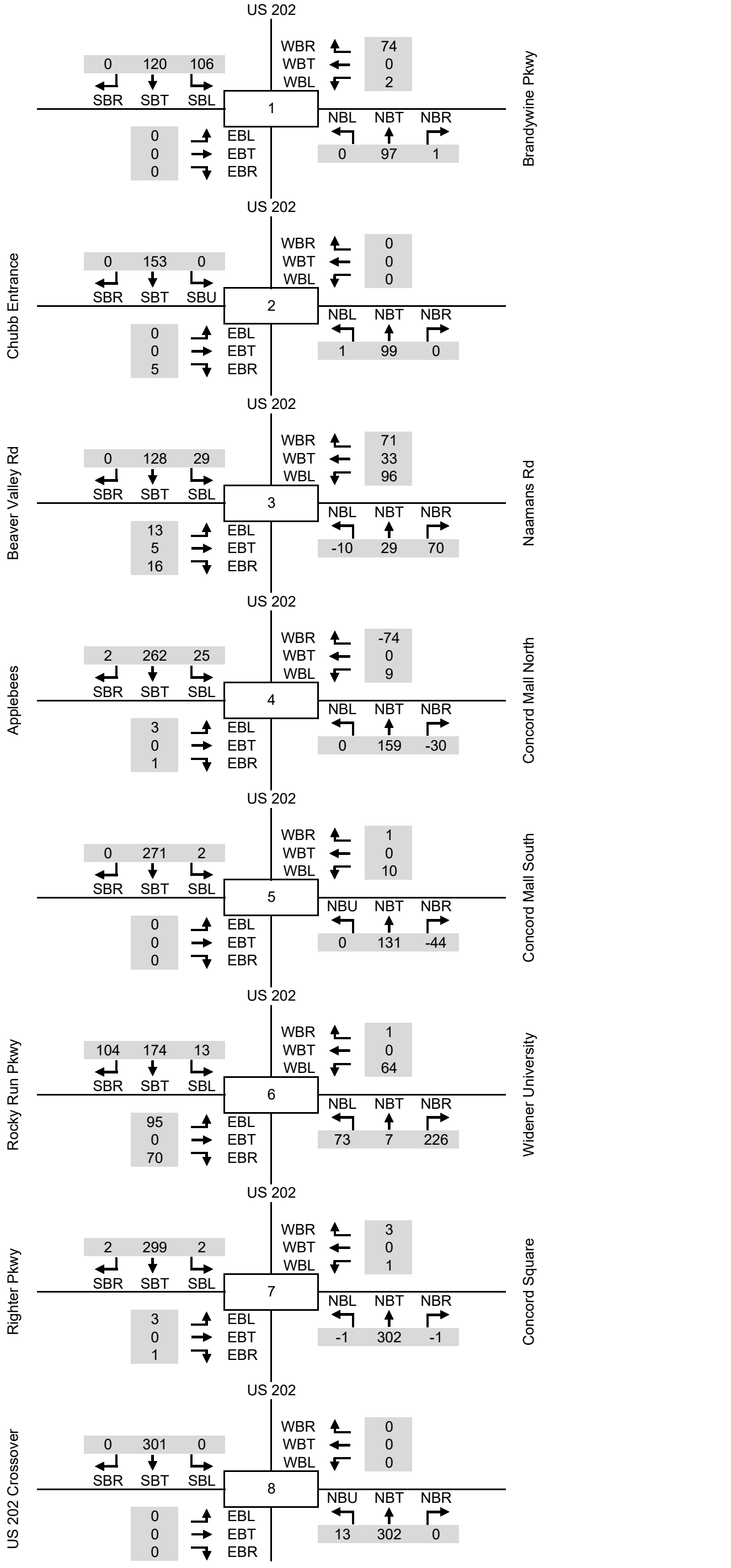

2050 Proposed Zoning Low - PM Volume Growth

Additional Roadway and Ped/Bike Connections

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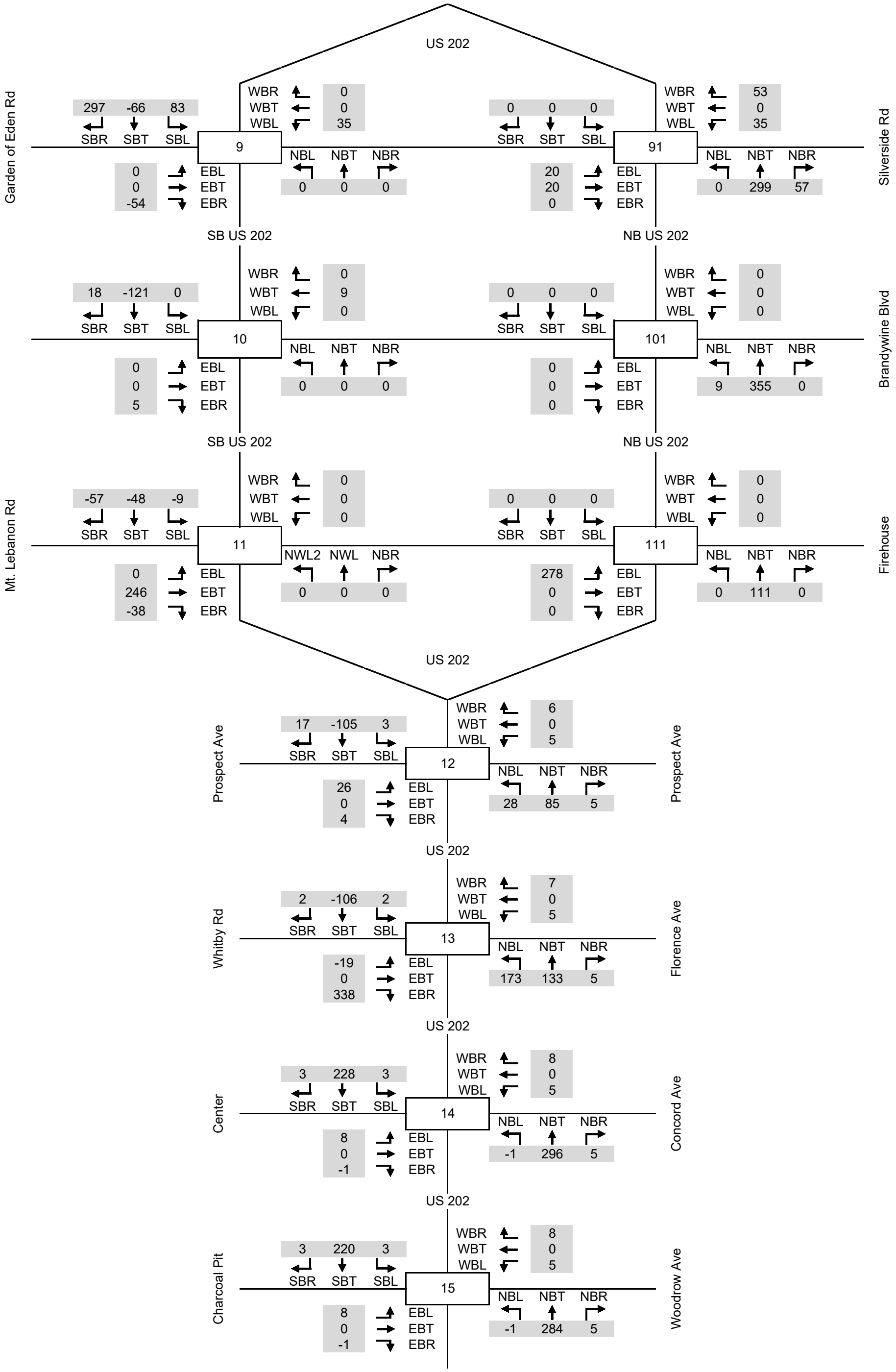

2050 Proposed Zoning Low - PM Volume Growth

Additional Roadway and Ped/Bike Connections

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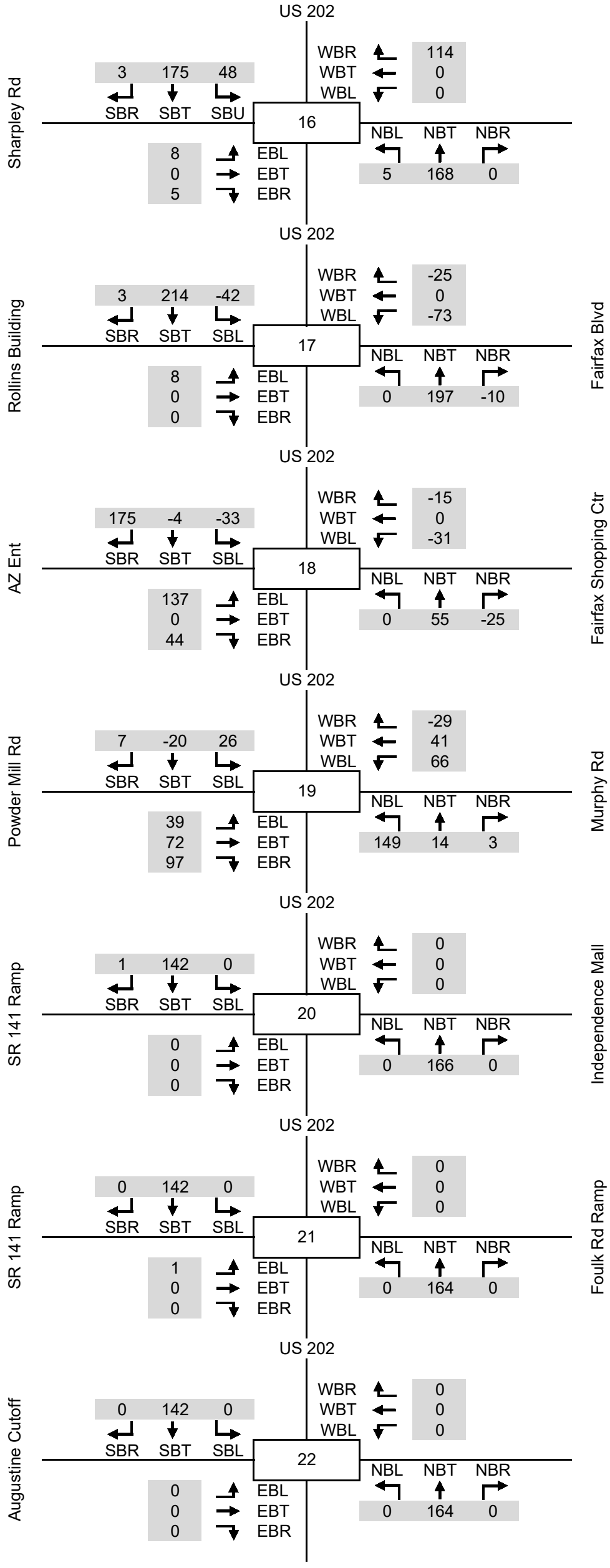

2050 Proposed Zoning Low - AM Volume Growth

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

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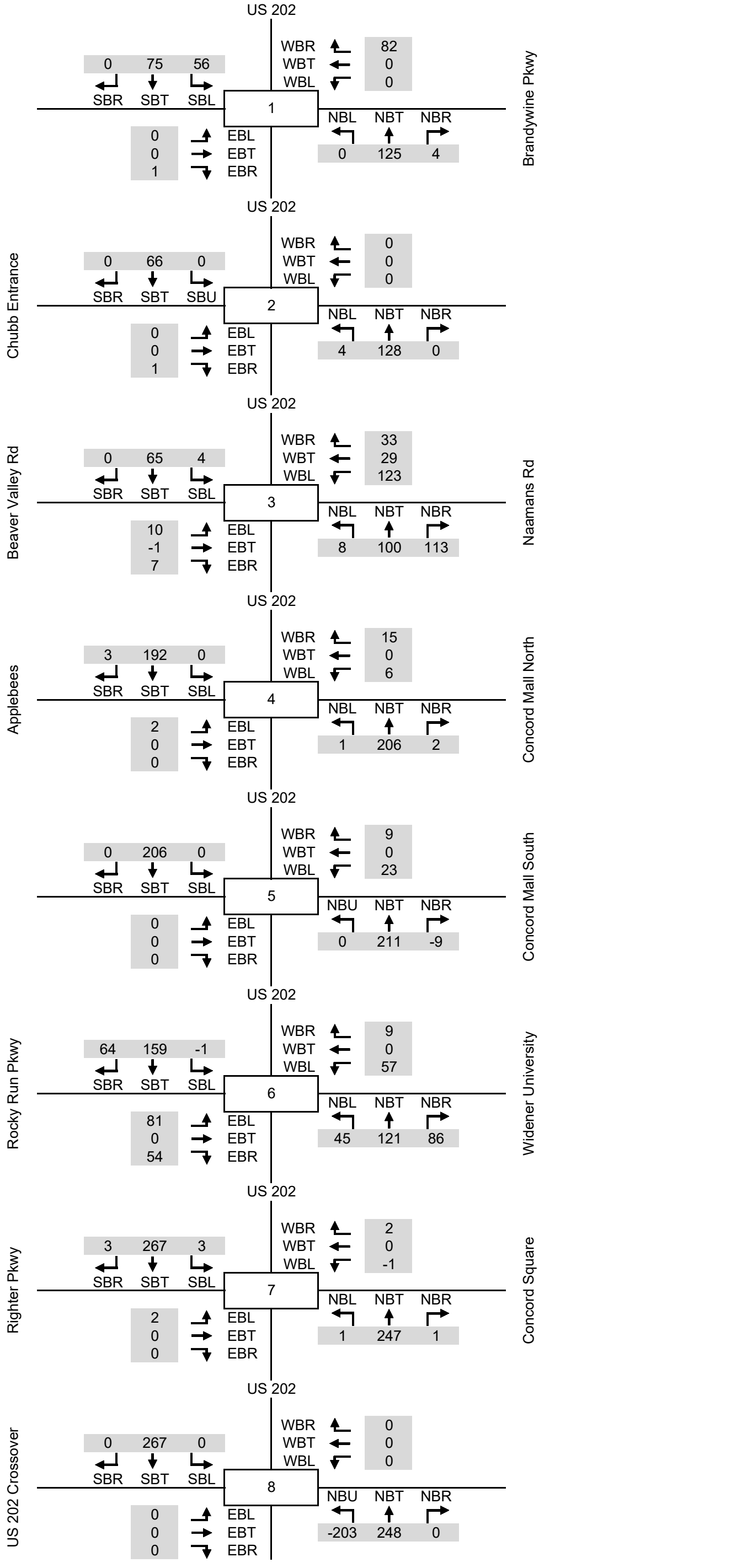

2050 Proposed Zoning Low - AM Volume Growth

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

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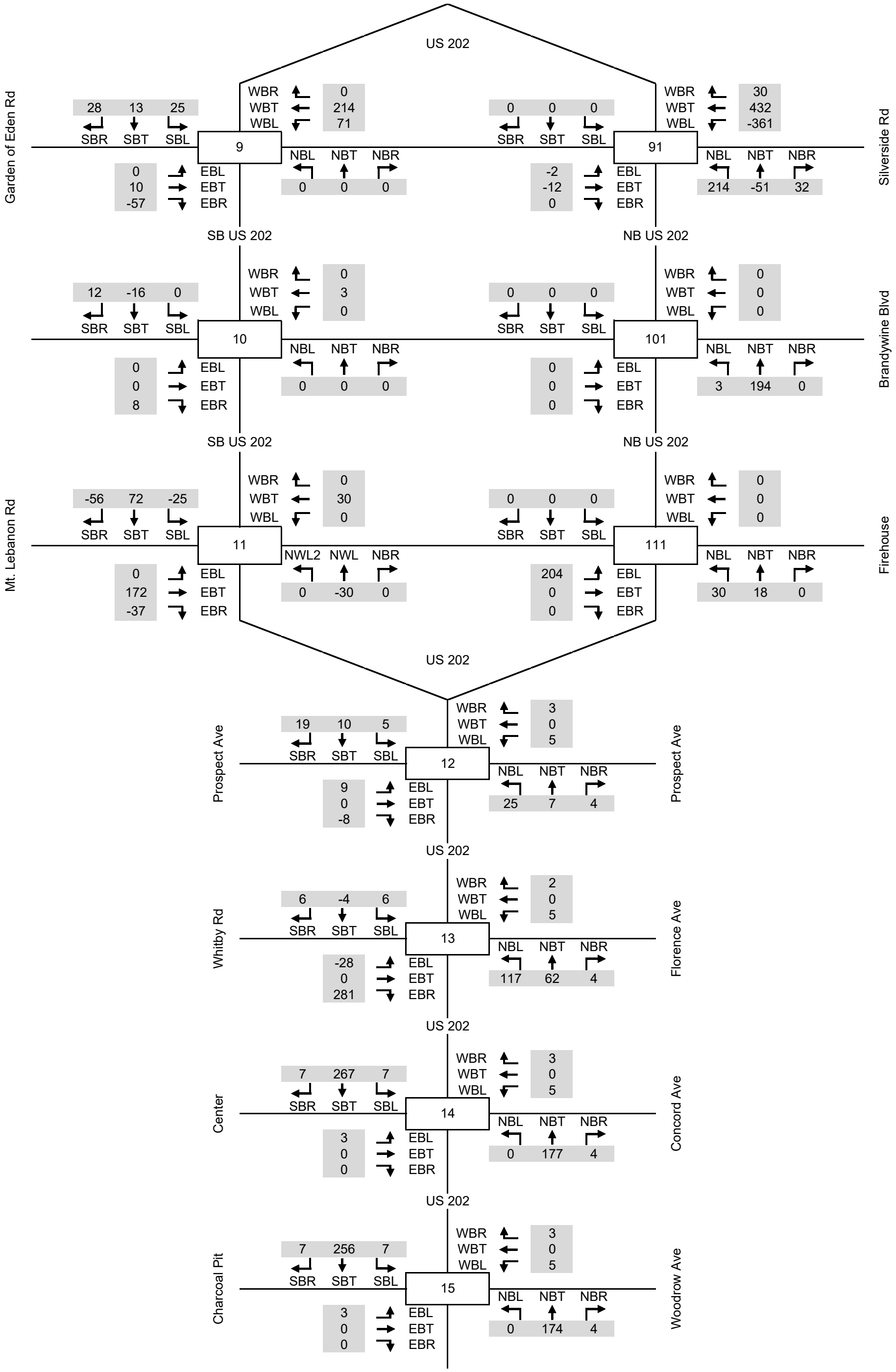

2050 Proposed Zoning Low - AM Volume Growth

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

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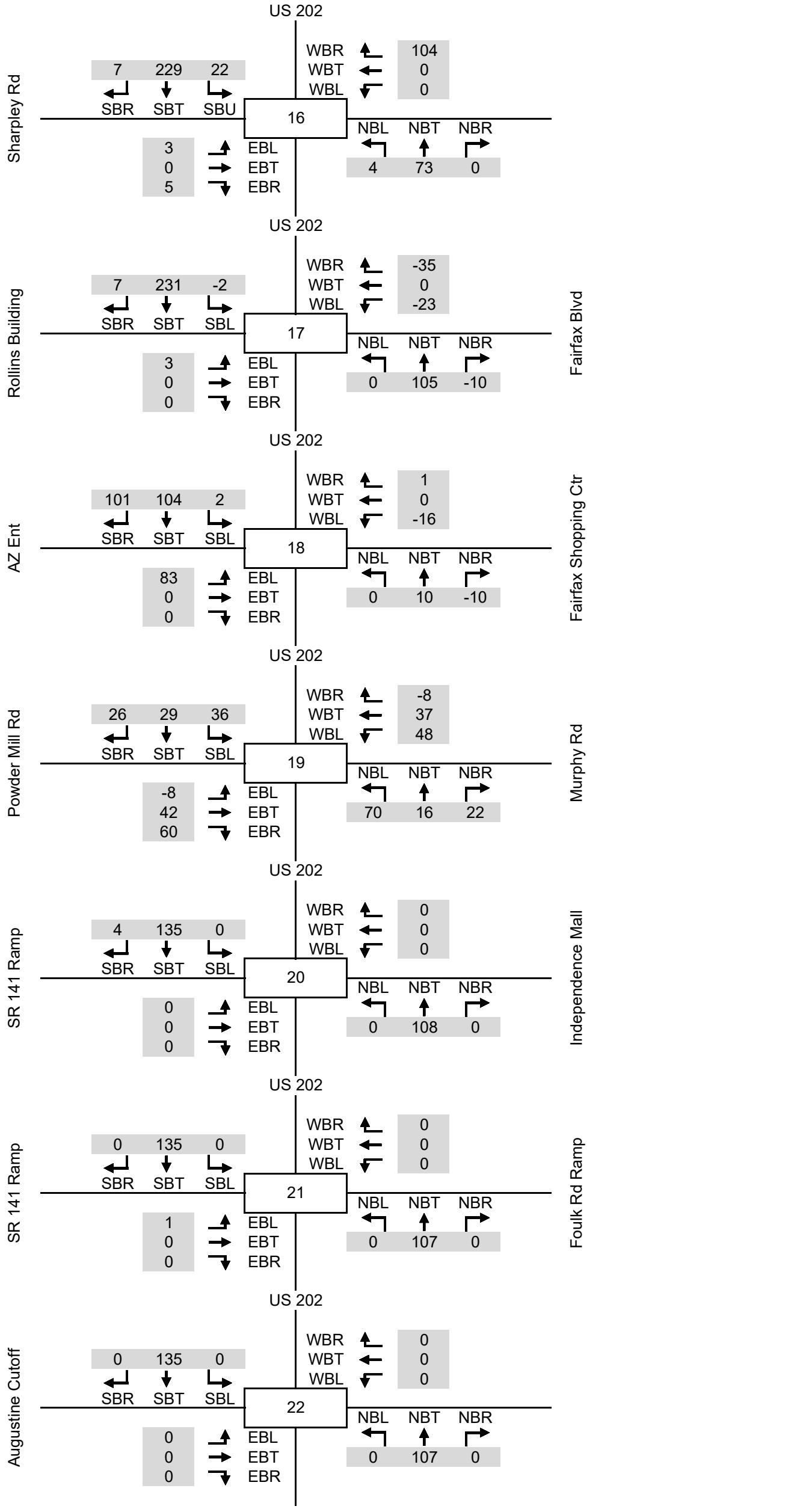

2050 Proposed Zoning Low - PM Volume Growth

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

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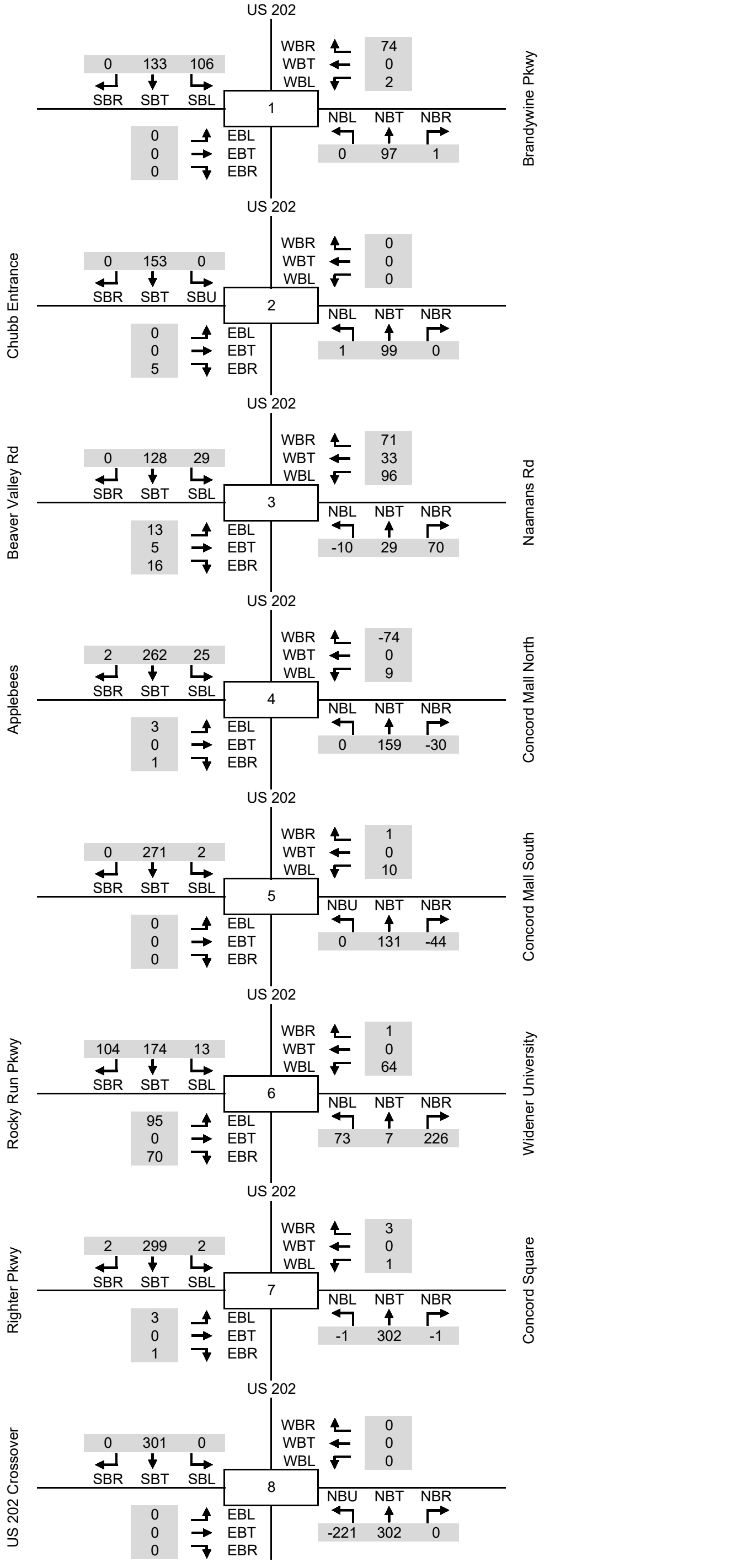

2050 Proposed Zoning Low - PM Volume Growth

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

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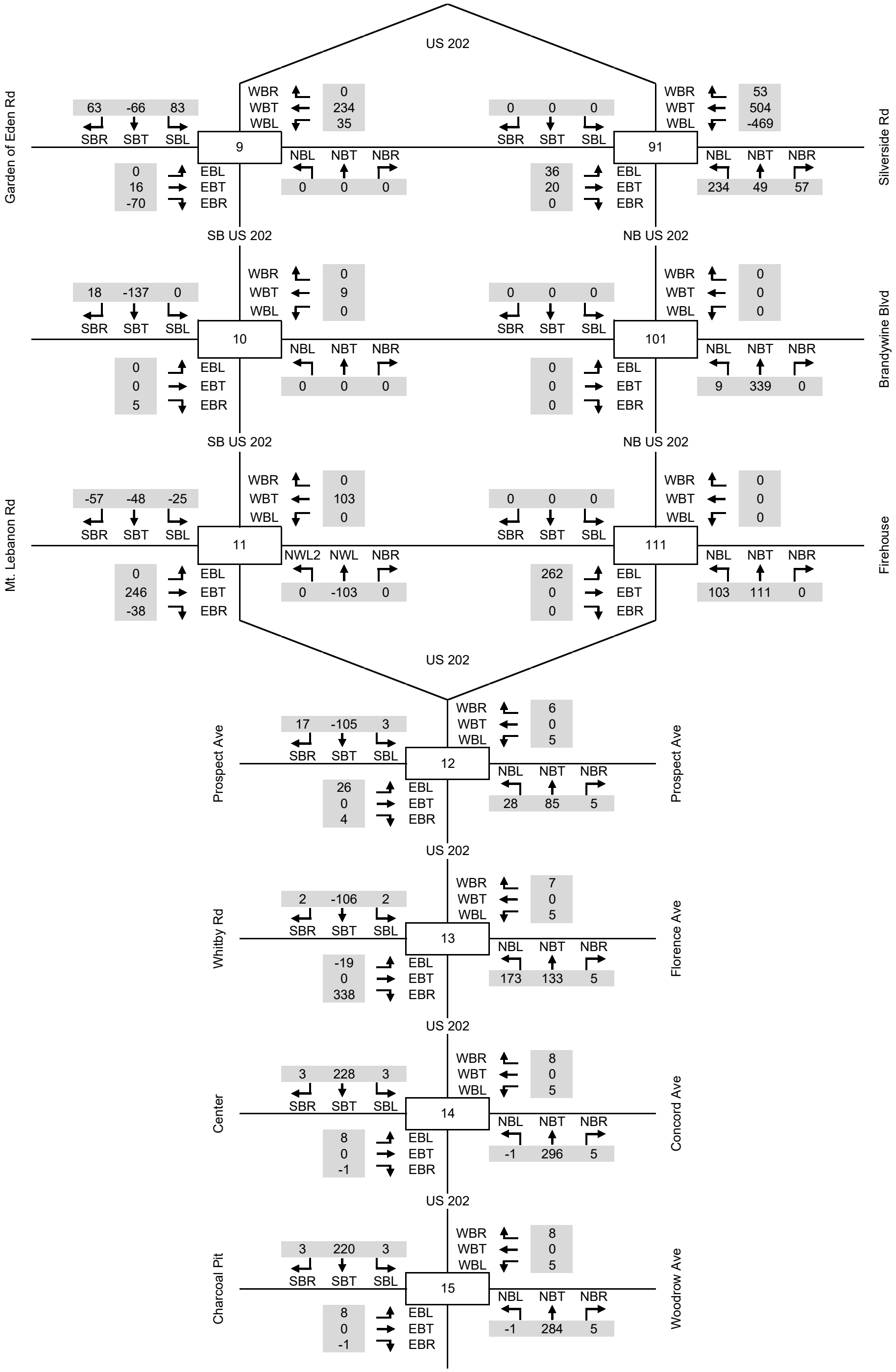

2050 Proposed Zoning Low - PM Volume Growth

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

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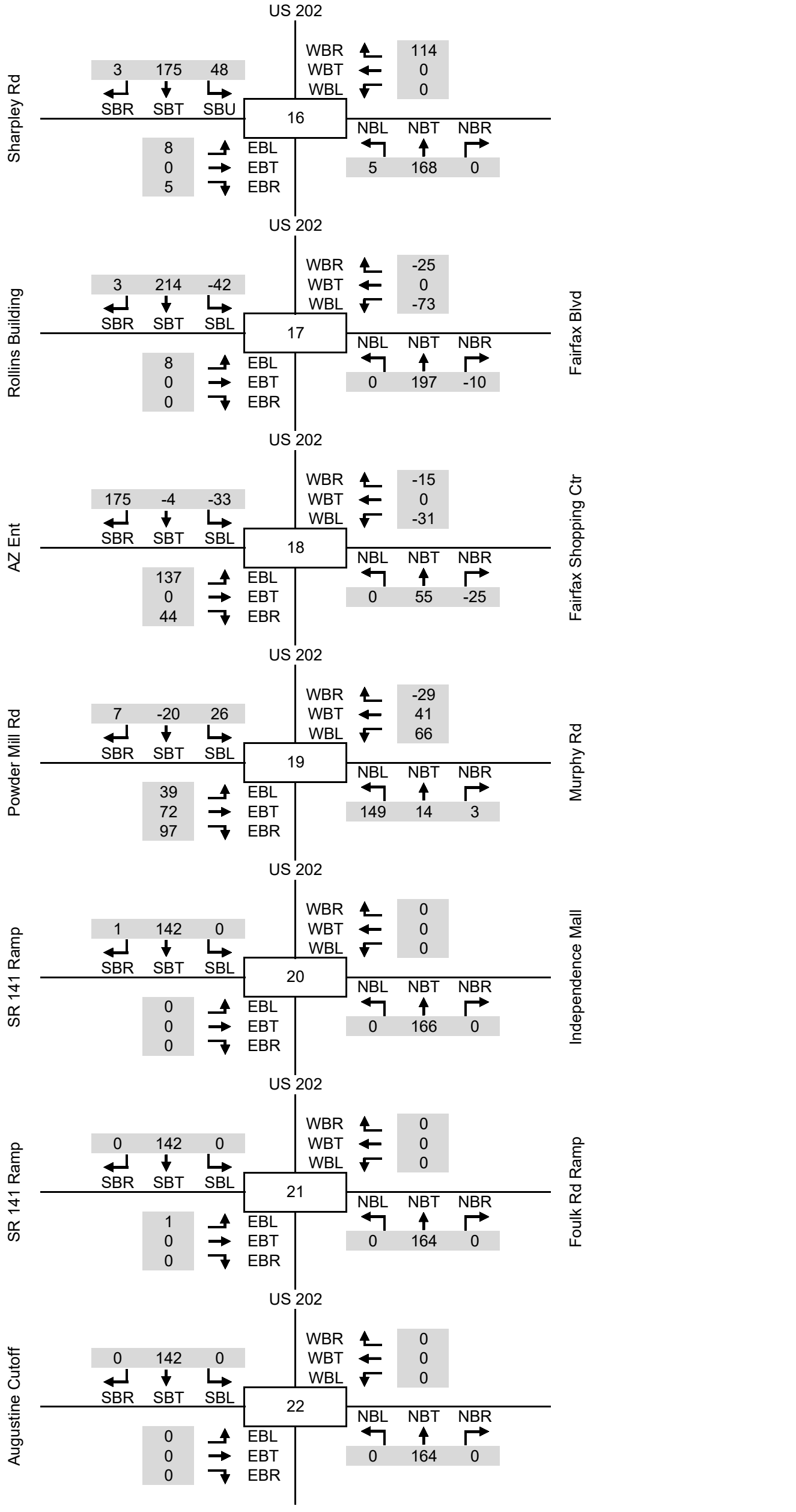

2050 Proposed Zoning High - AM Volume Growth

Exiting Transportation Infrastructure

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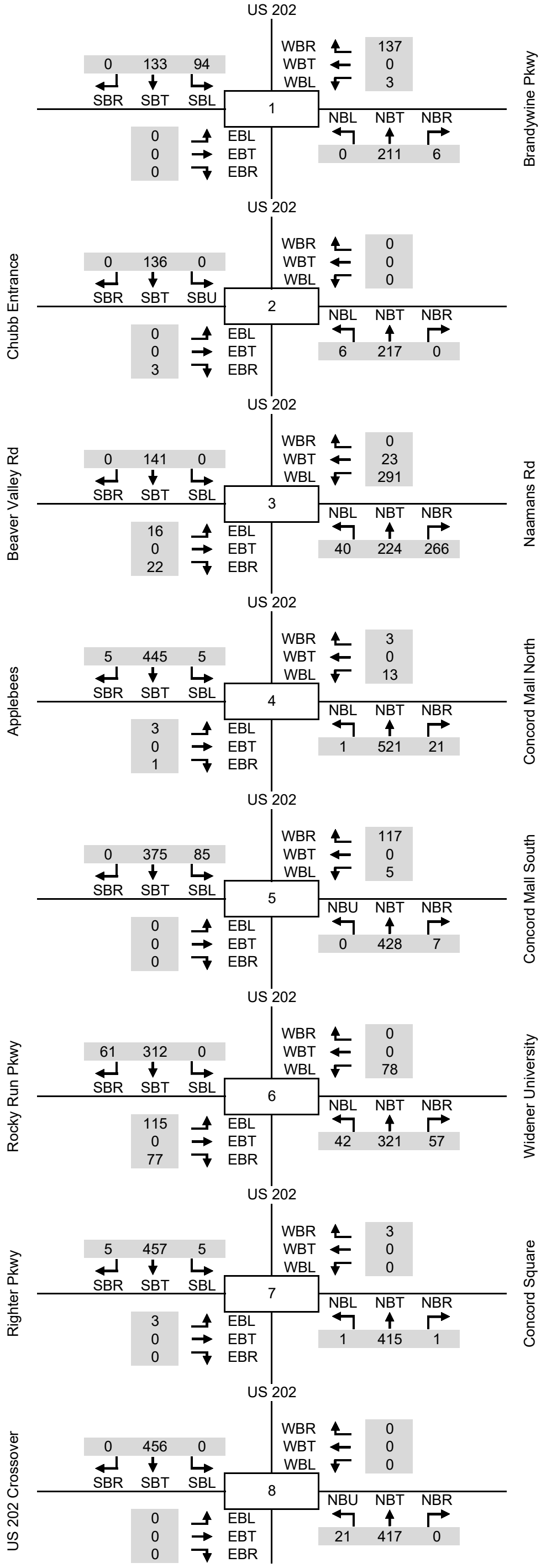

2050 Proposed Zoning High - AM Volume Growth

Exiting Transportation Infrastructure

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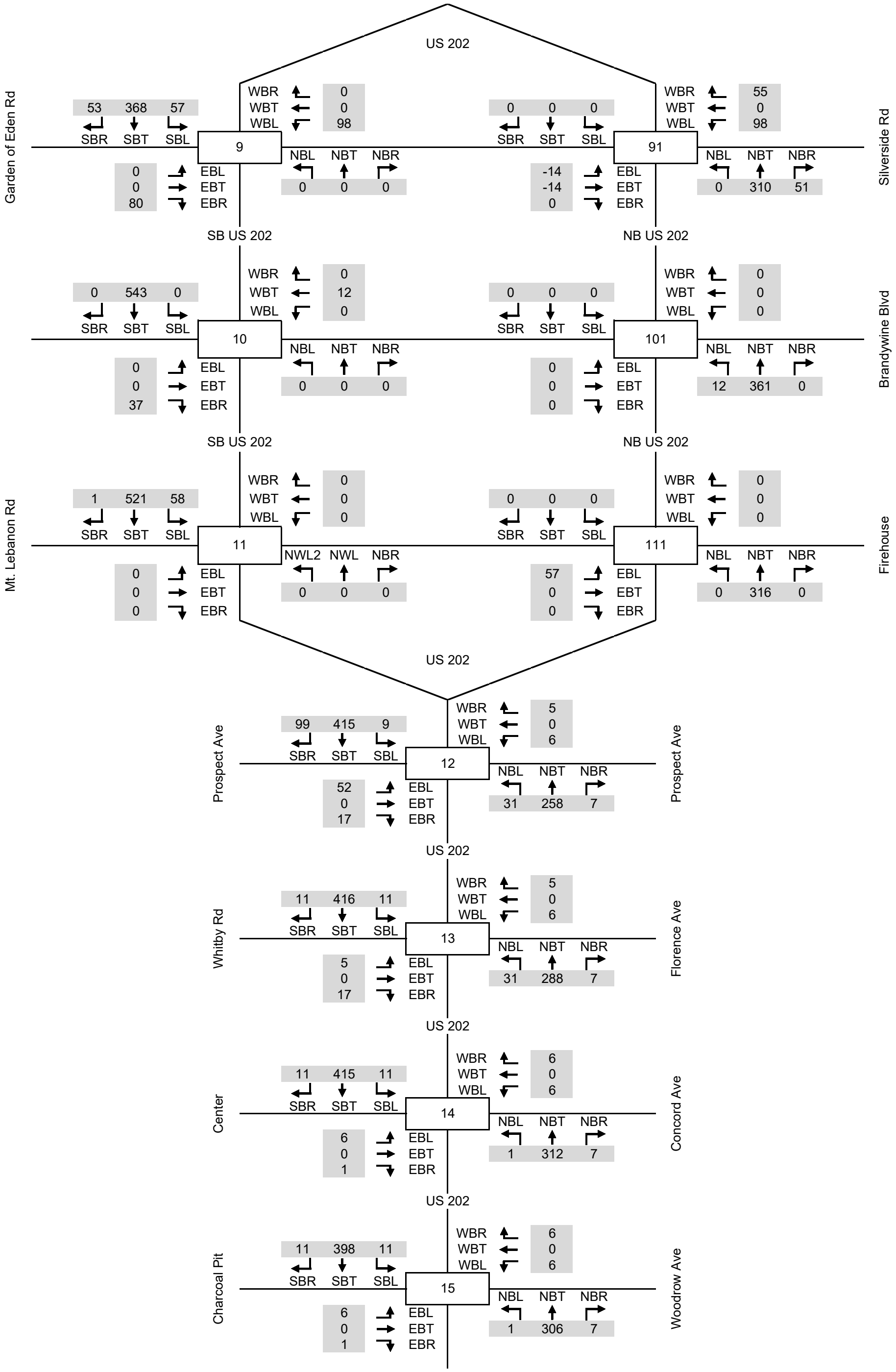
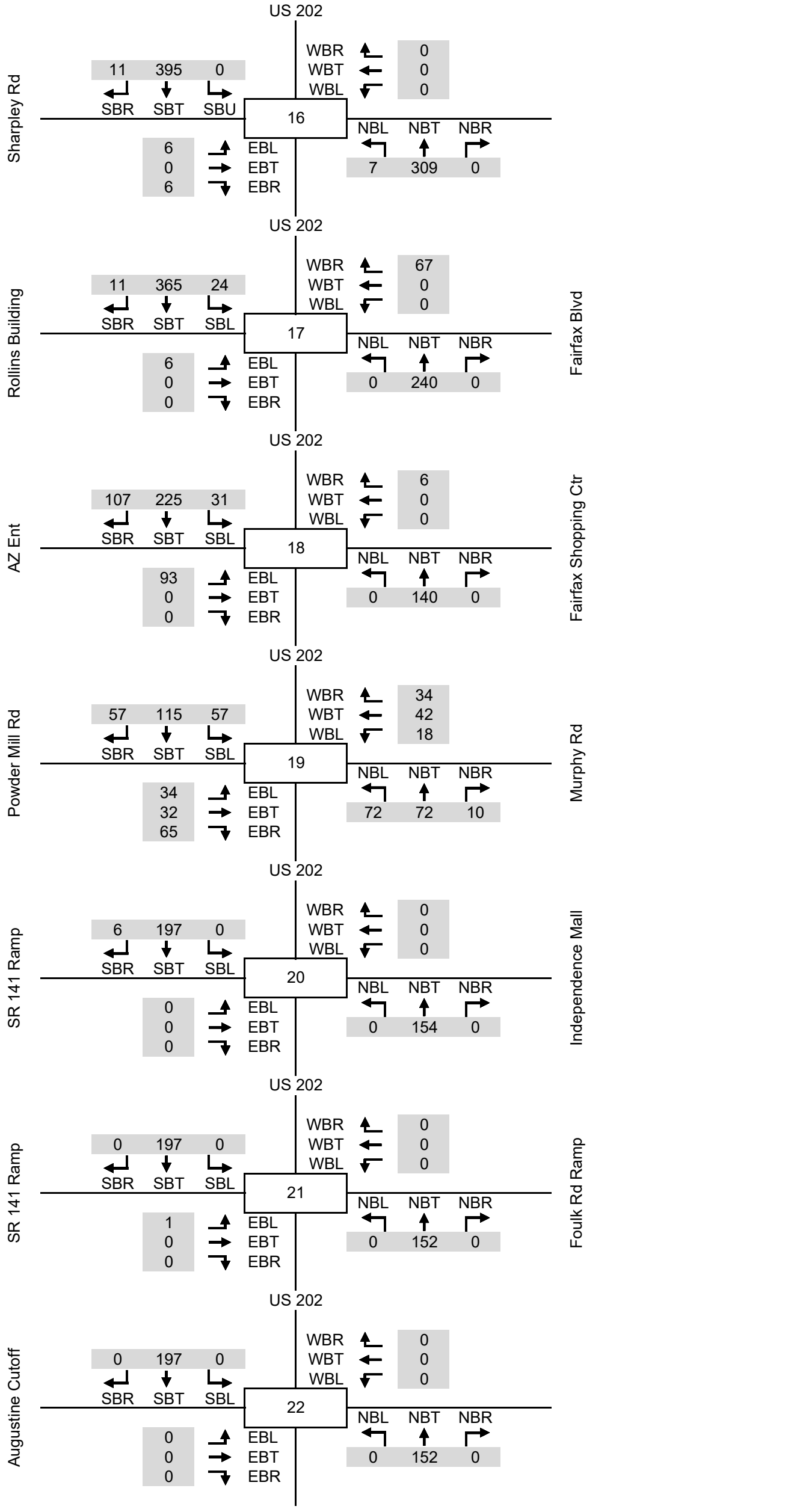


2050 Proposed Zoning High - AM Volume Growth

Exiting Transportation Infrastructure

N



2050 Proposed Zoning High - PM Volume Growth

Exiting Transportation Infrastructure

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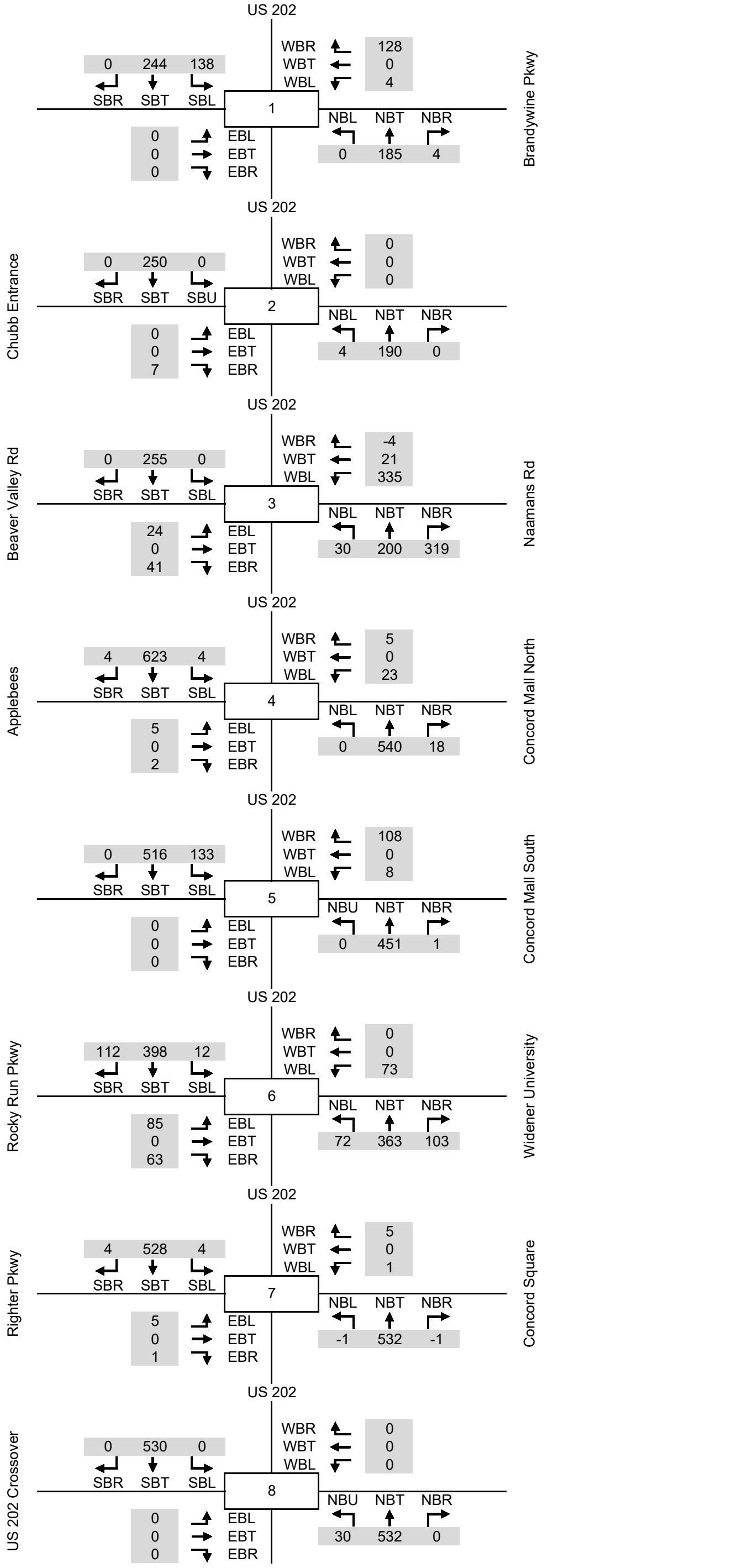

2050 Proposed Zoning High - PM Volume Growth

Exiting Transportation Infrastructure

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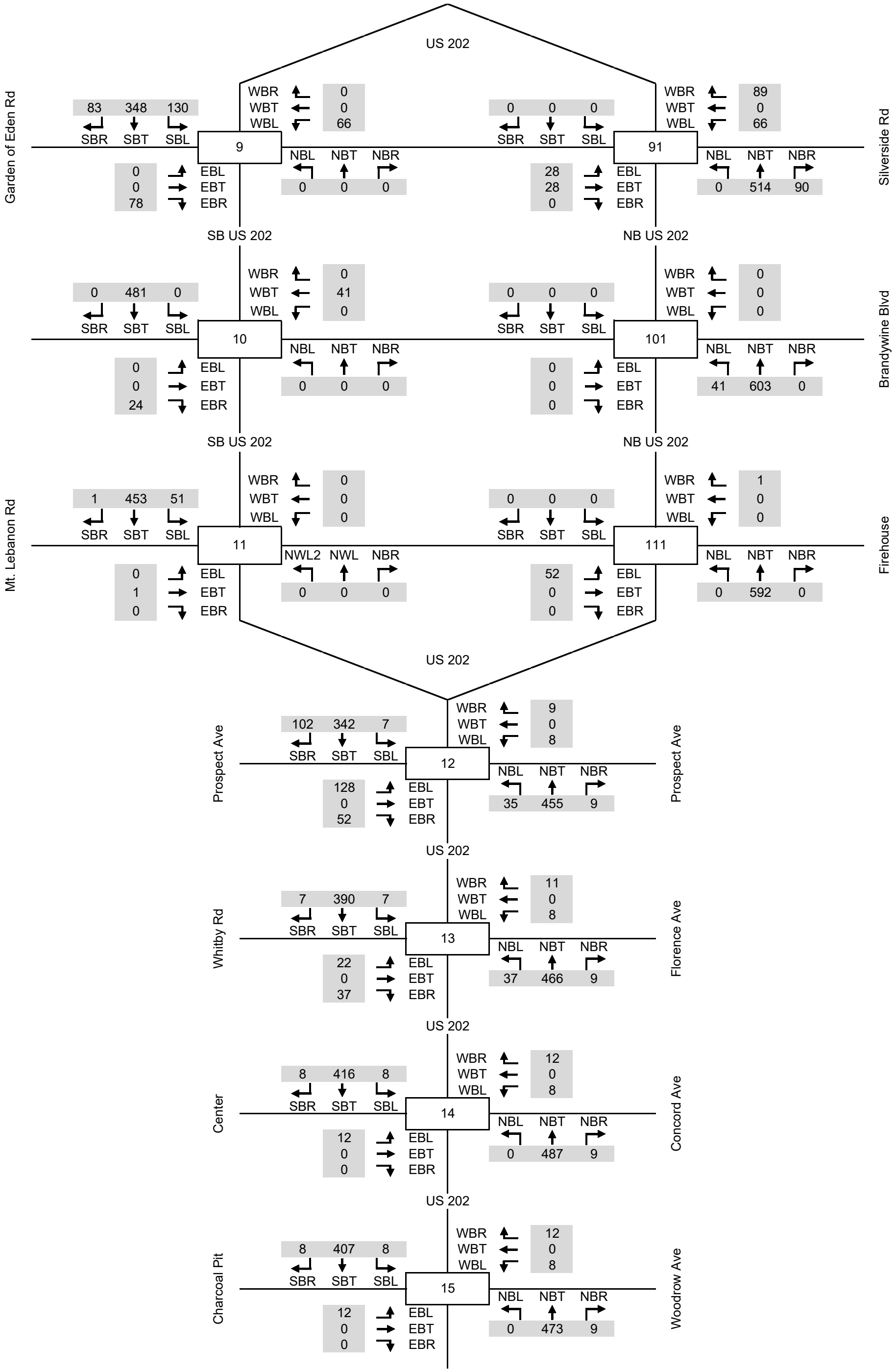

2050 Proposed Zoning High - PM Volume Growth

Exiting Transportation Infrastructure

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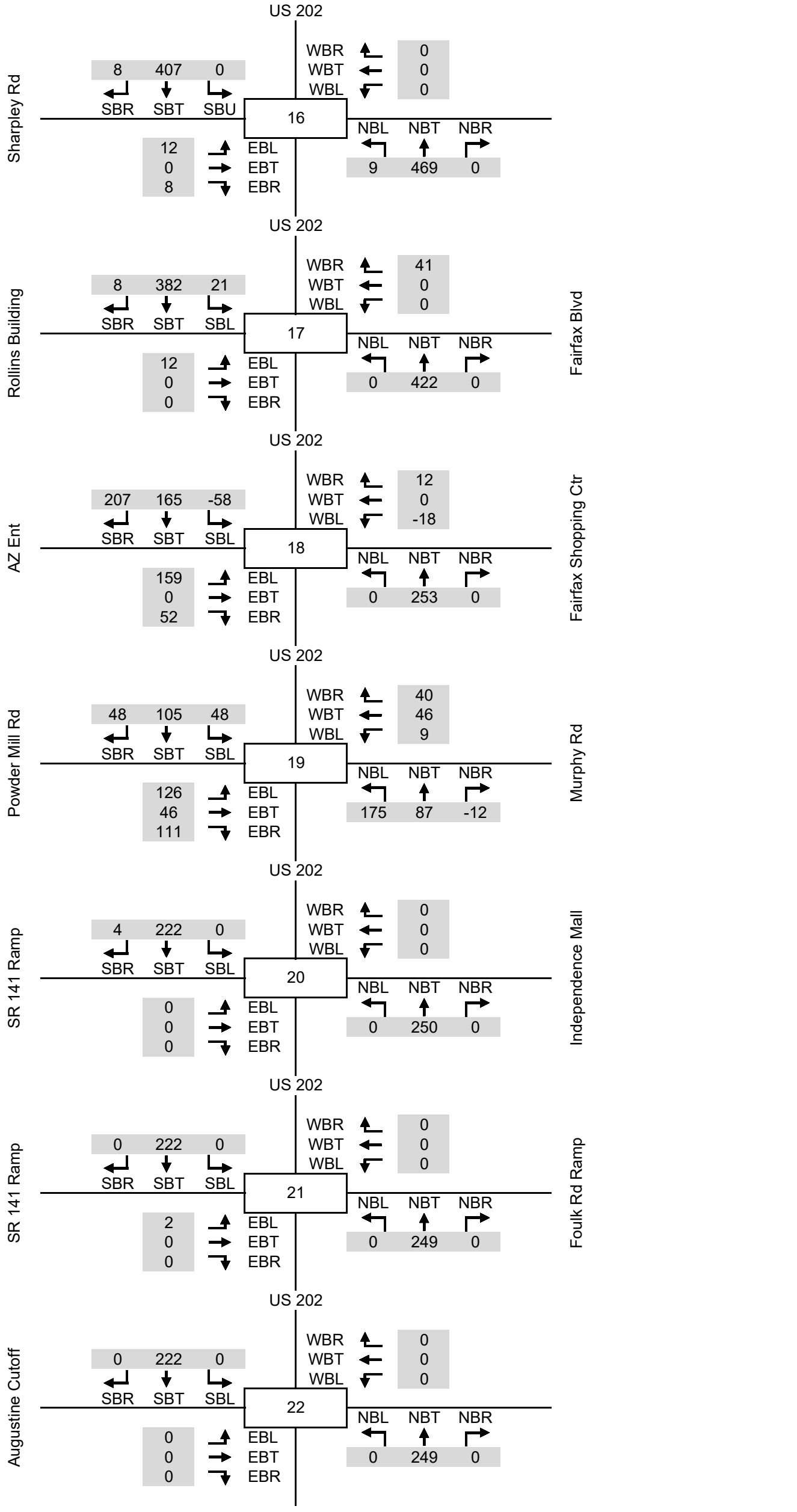

2050 Proposed Zoning High - AM Volume Growth

Additional Roadway Connections

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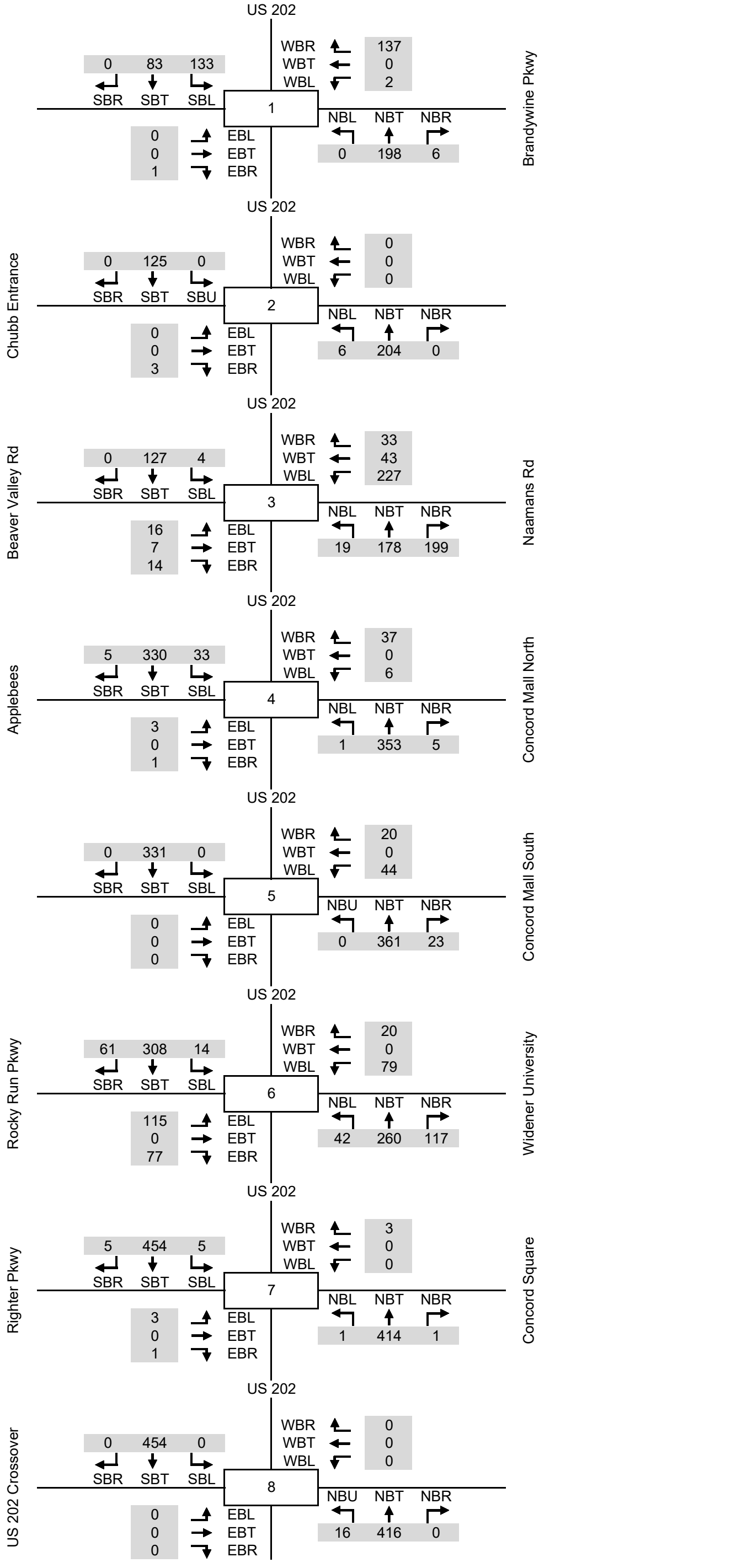

2050 Proposed Zoning High - AM Volume Growth

Additional Roadway Connections

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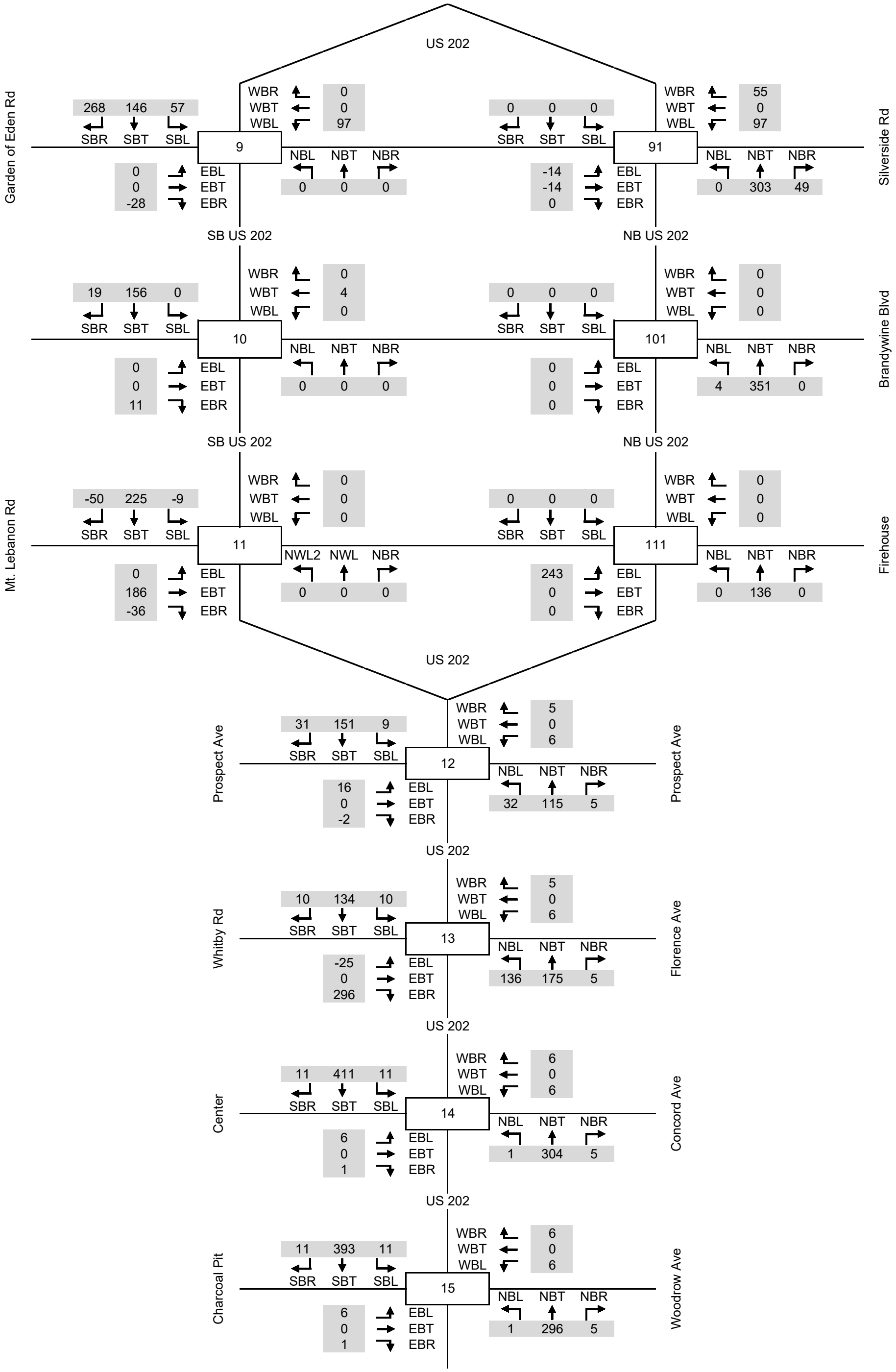

2050 Proposed Zoning High - AM Volume Growth

Additional Roadway Connections

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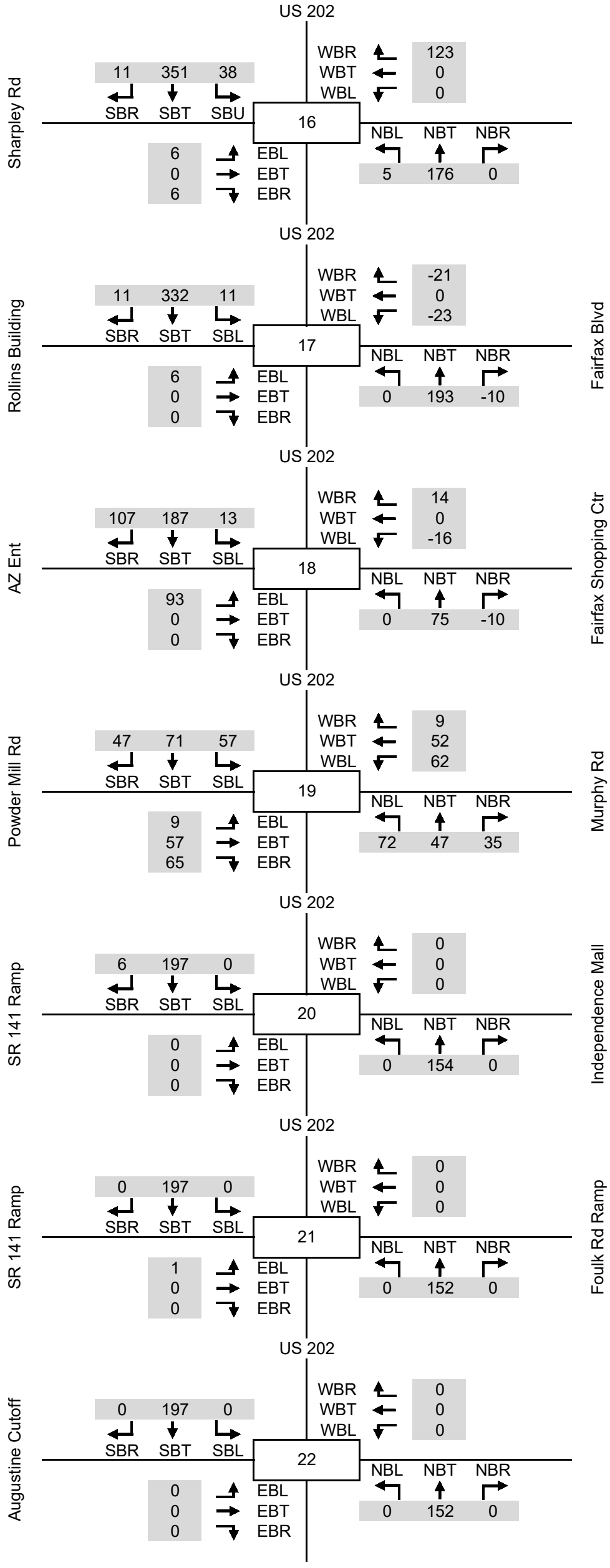

2050 Proposed Zoning High - PM Volume Growth

Additional Roadway Connections

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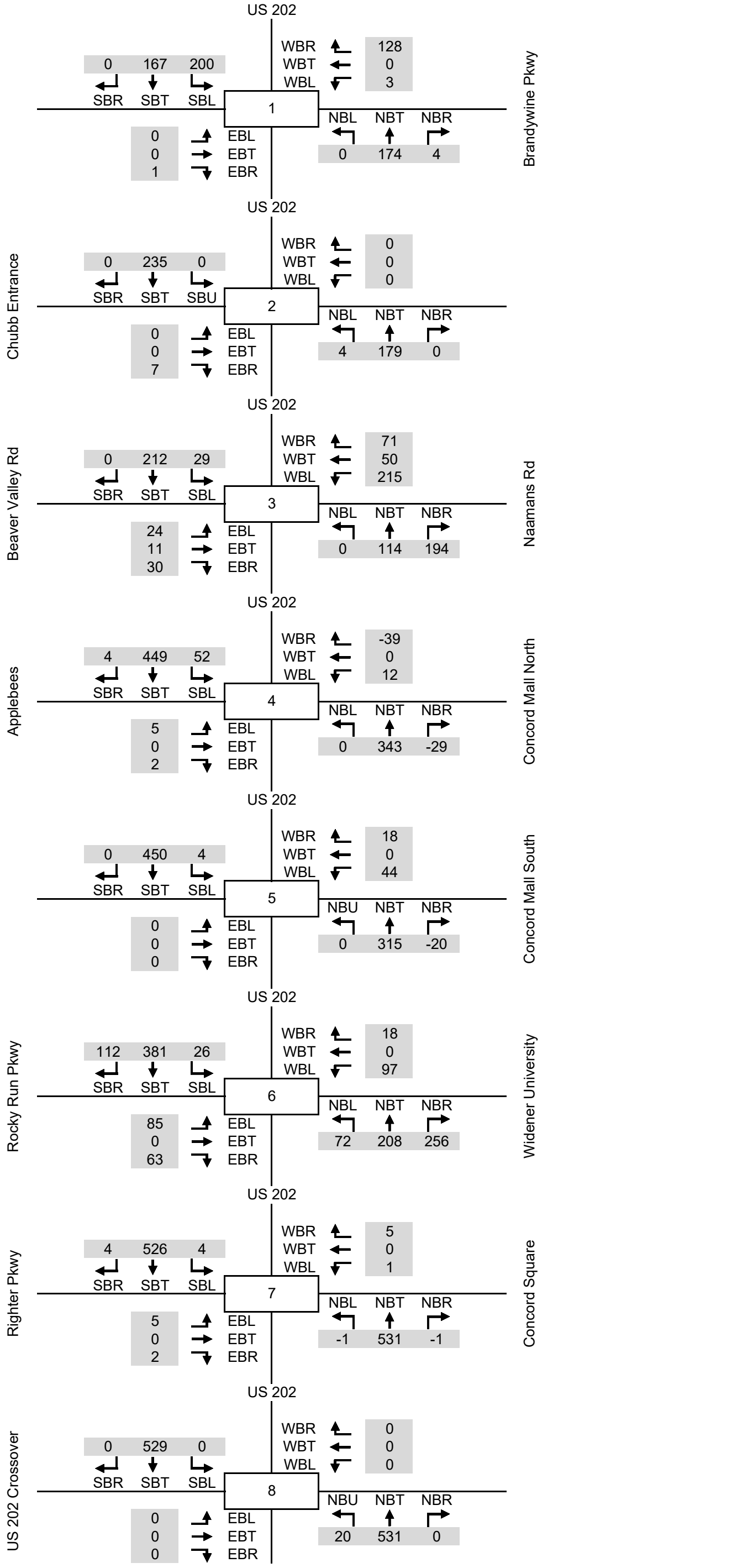

2050 Proposed Zoning High - PM Volume Growth

Additional Roadway Connections

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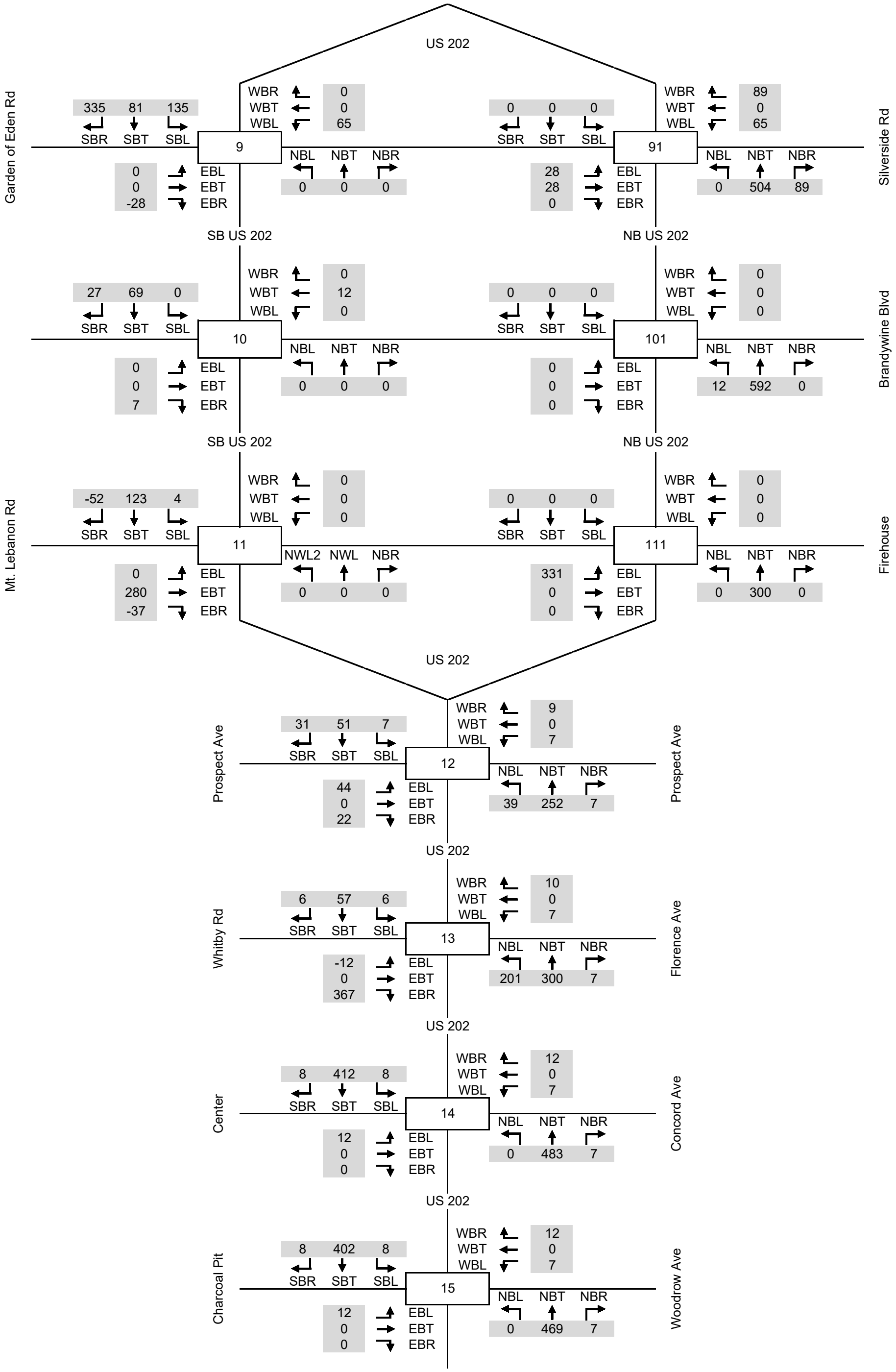

2050 Proposed Zoning High - PM Volume Growth

Additional Roadway Connections

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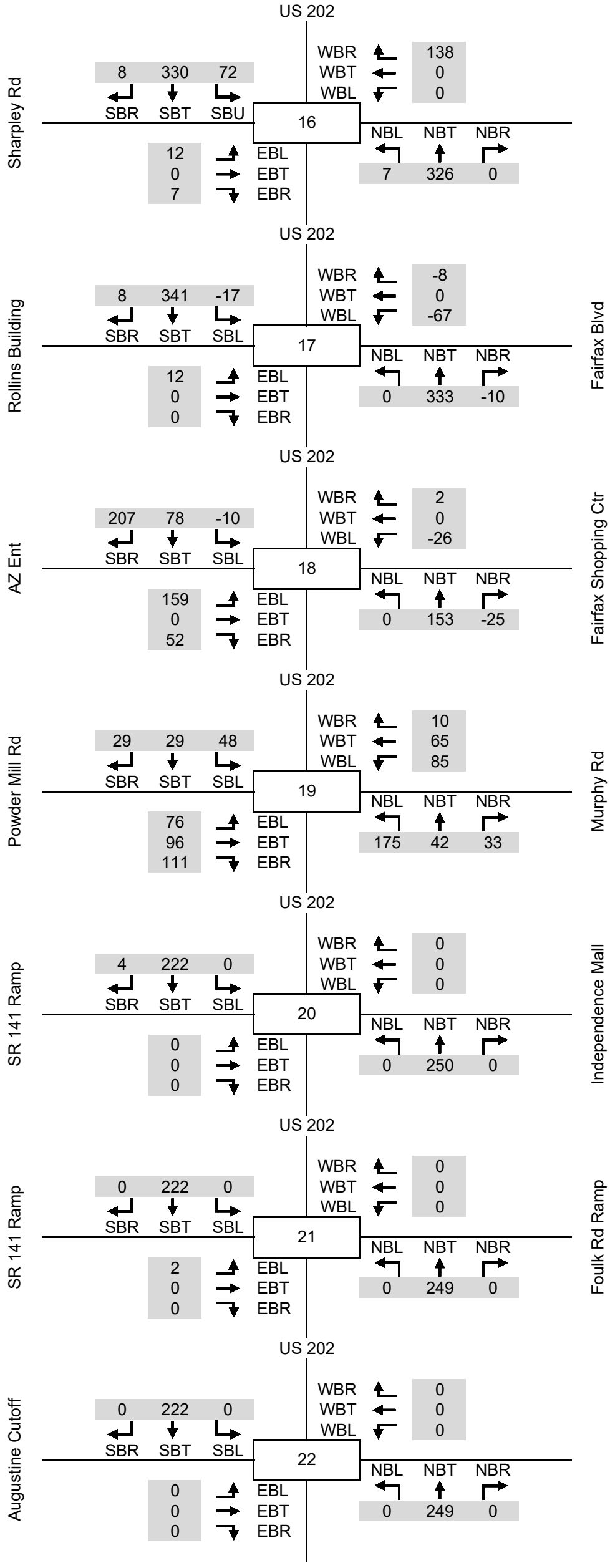

2050 Proposed Zoning High - AM Volume Growth

Additional Roadway and Ped/Bike Connections

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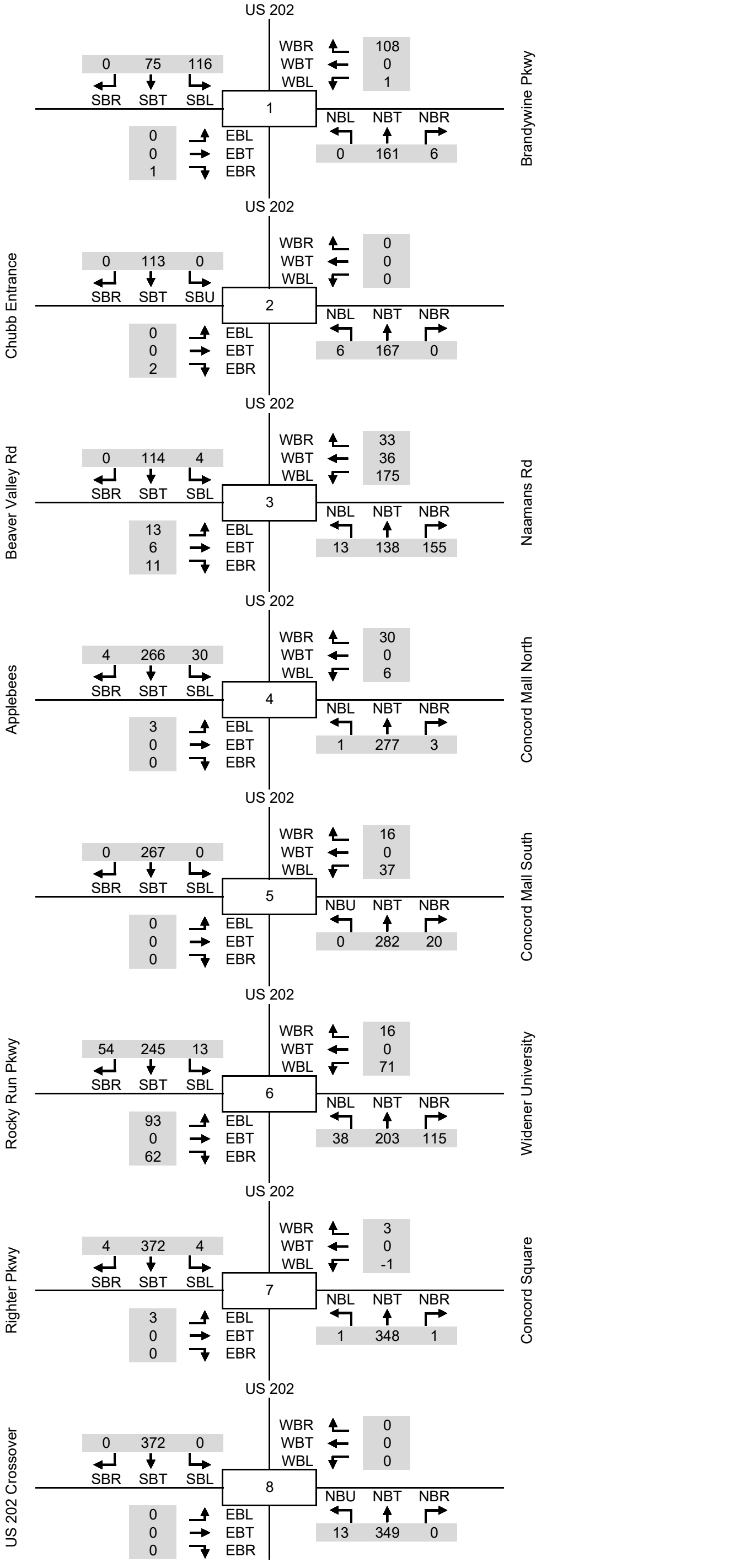

2050 Proposed Zoning High - AM Volume Growth

Additional Roadway and Ped/Bike Connections

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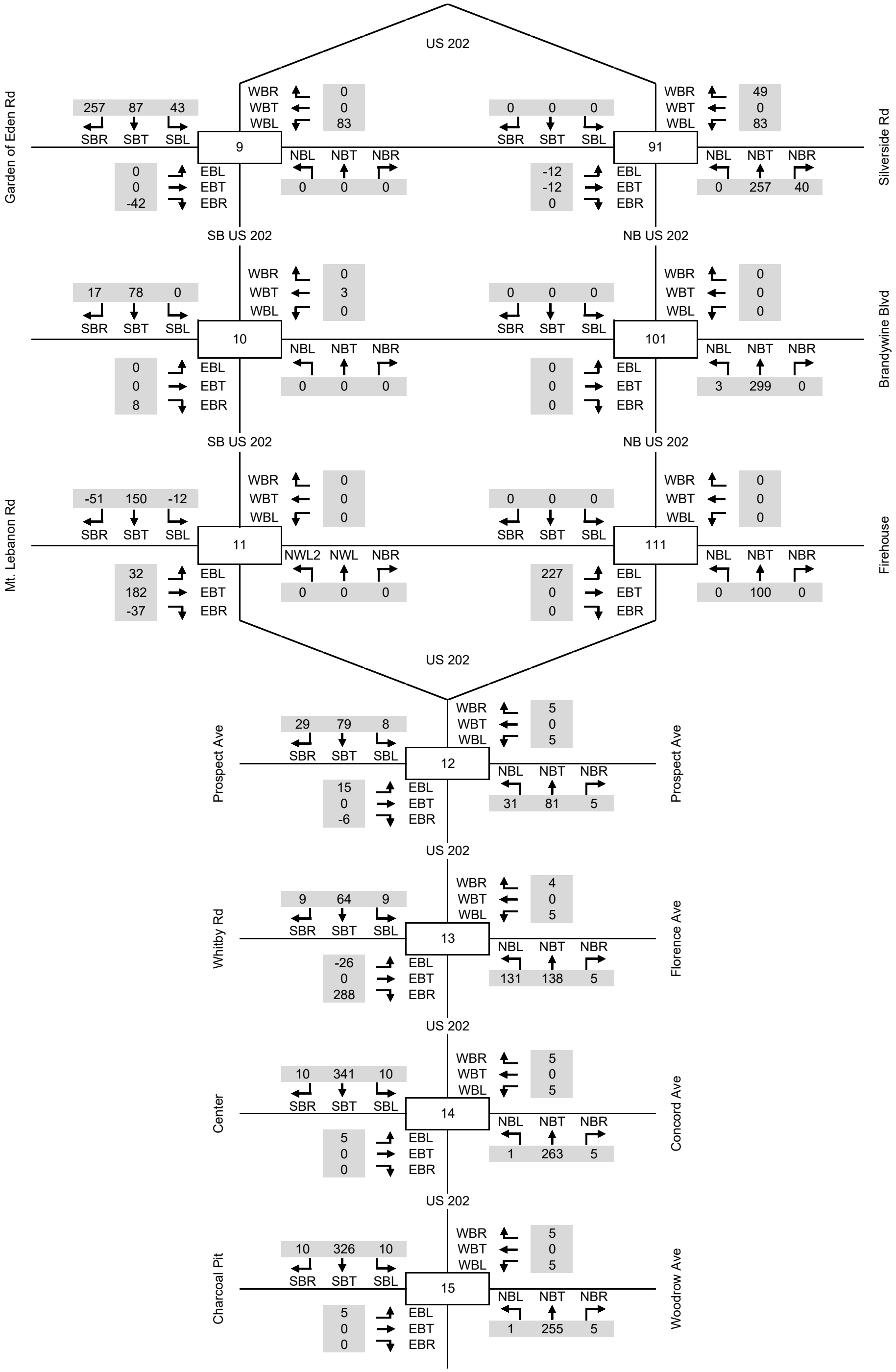

2050 Proposed Zoning High - AM Volume Growth

Additional Roadway and Ped/Bike Connections

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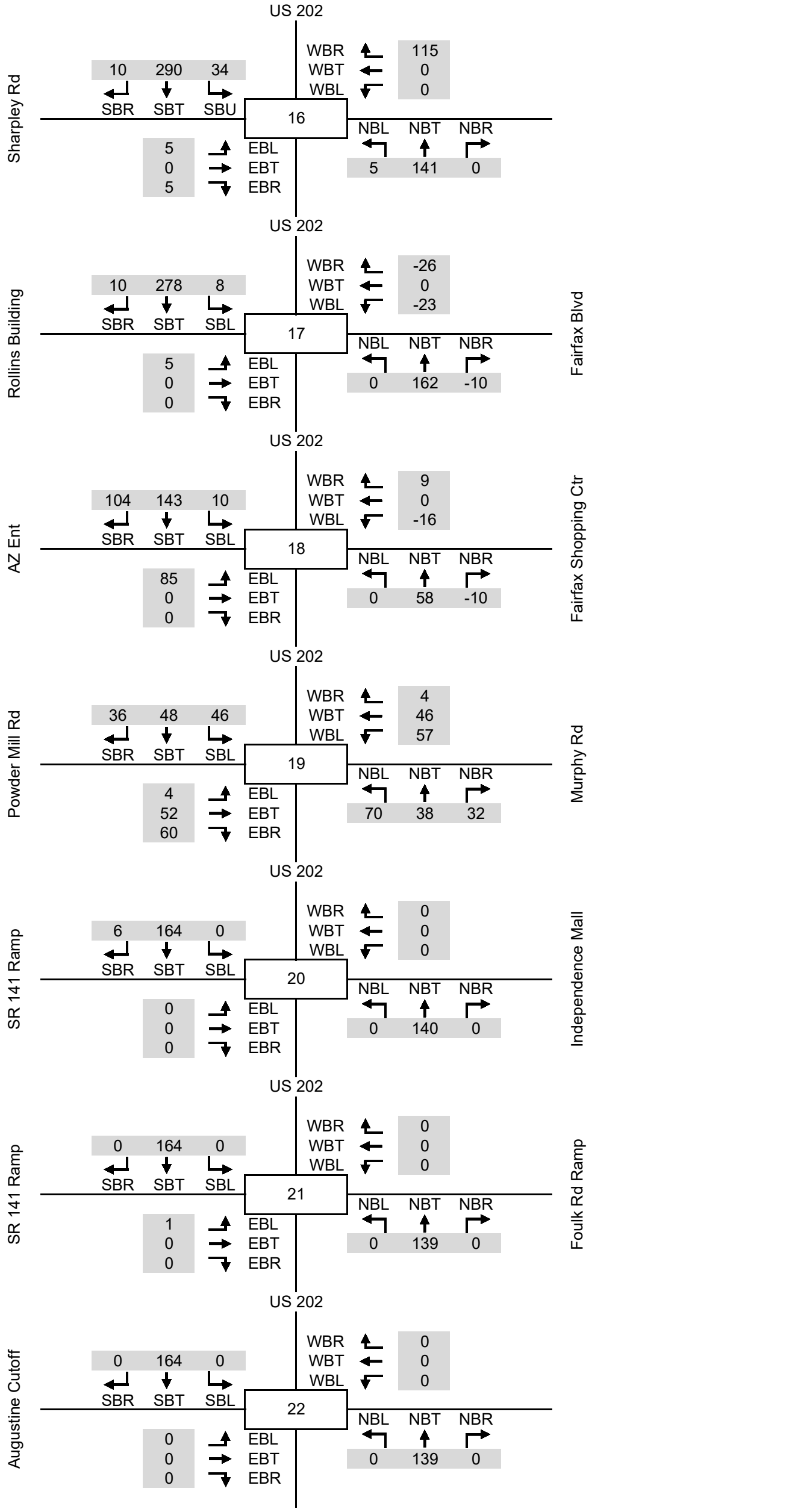

2050 Proposed Zoning High - PM Volume Growth

Additional Roadway and Ped/Bike Connections

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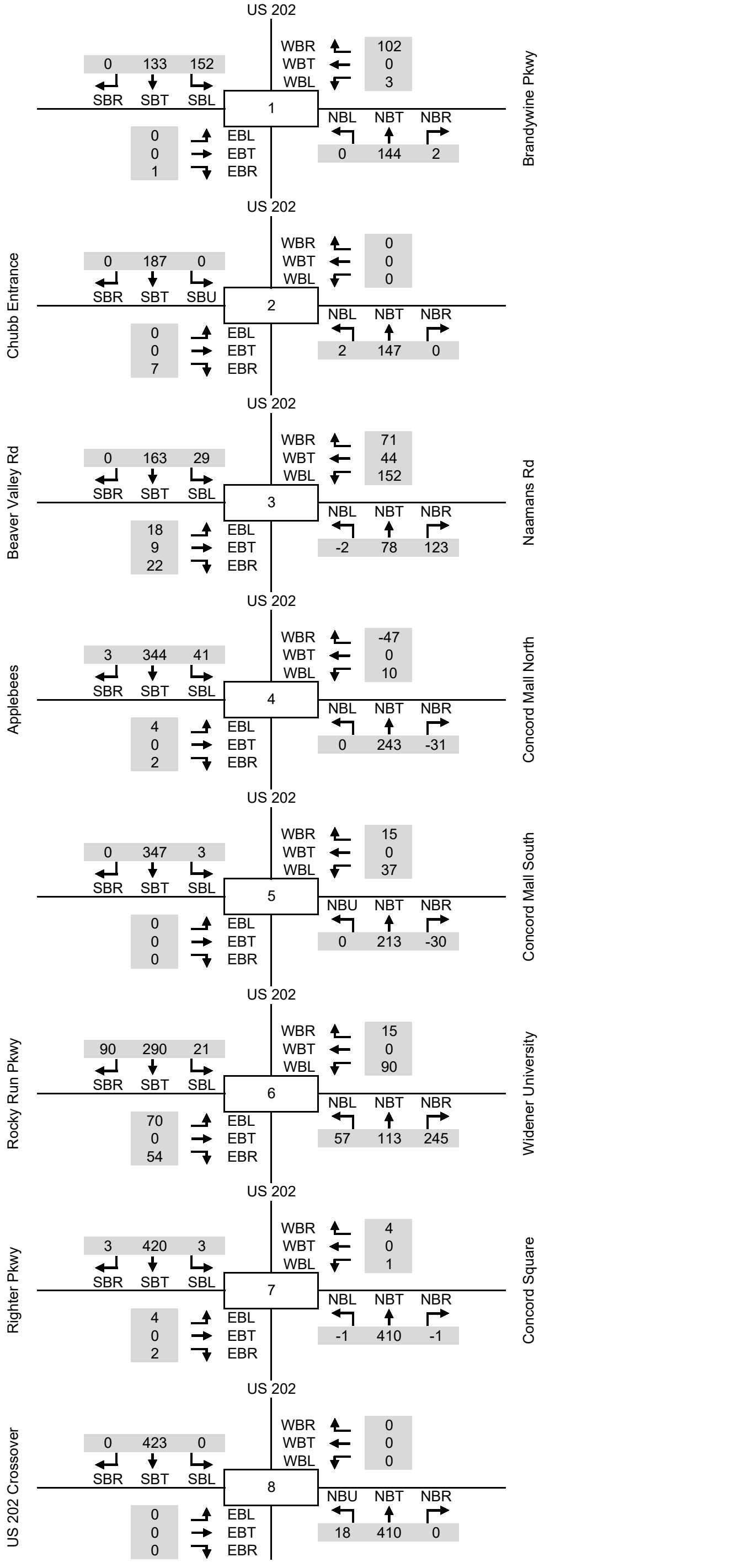

2050 Proposed Zoning High - PM Volume Growth

Additional Roadway and Ped/Bike Connections

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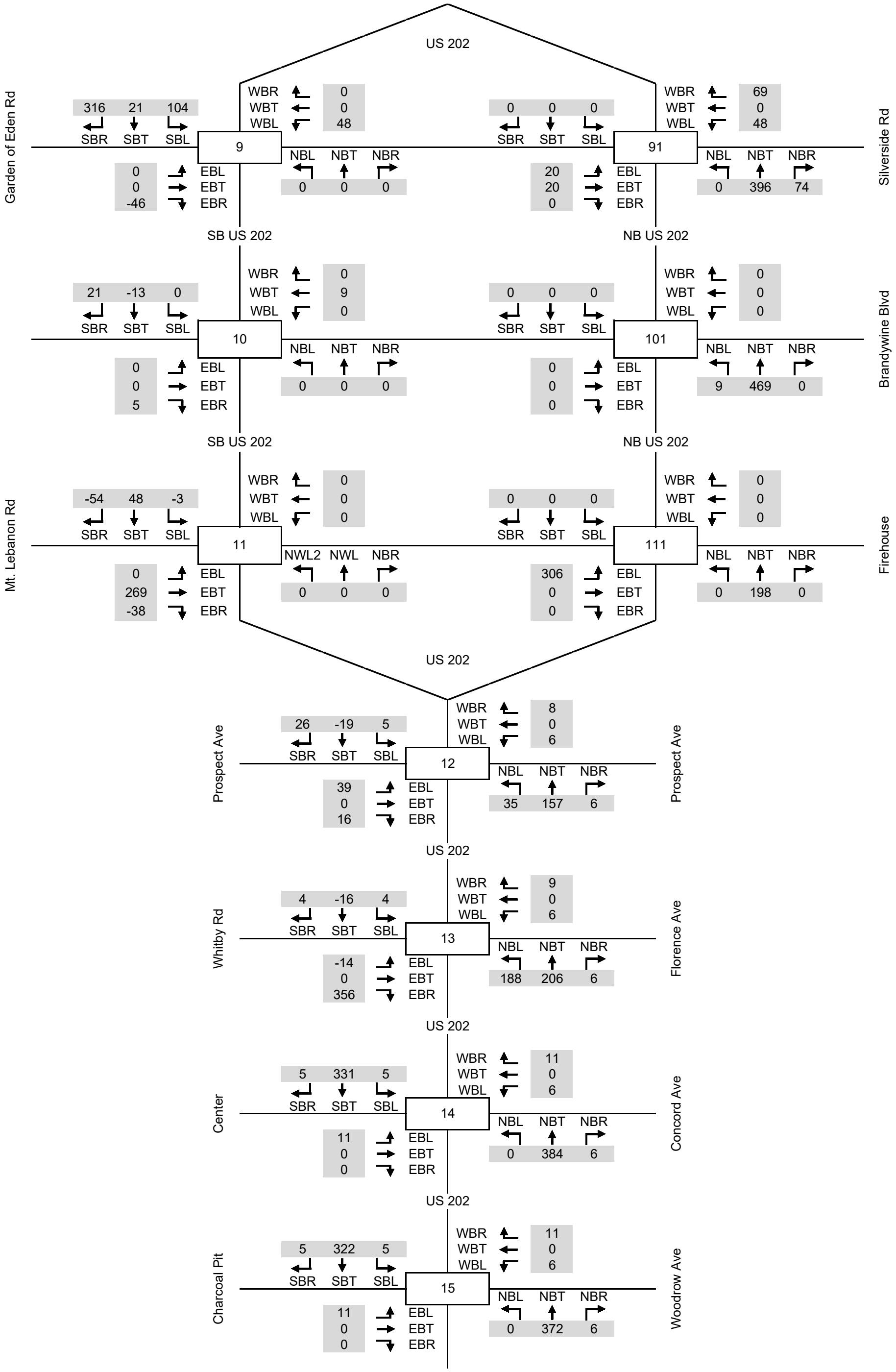

2050 Proposed Zoning High - PM Volume Growth

Additional Roadway and Ped/Bike Connections

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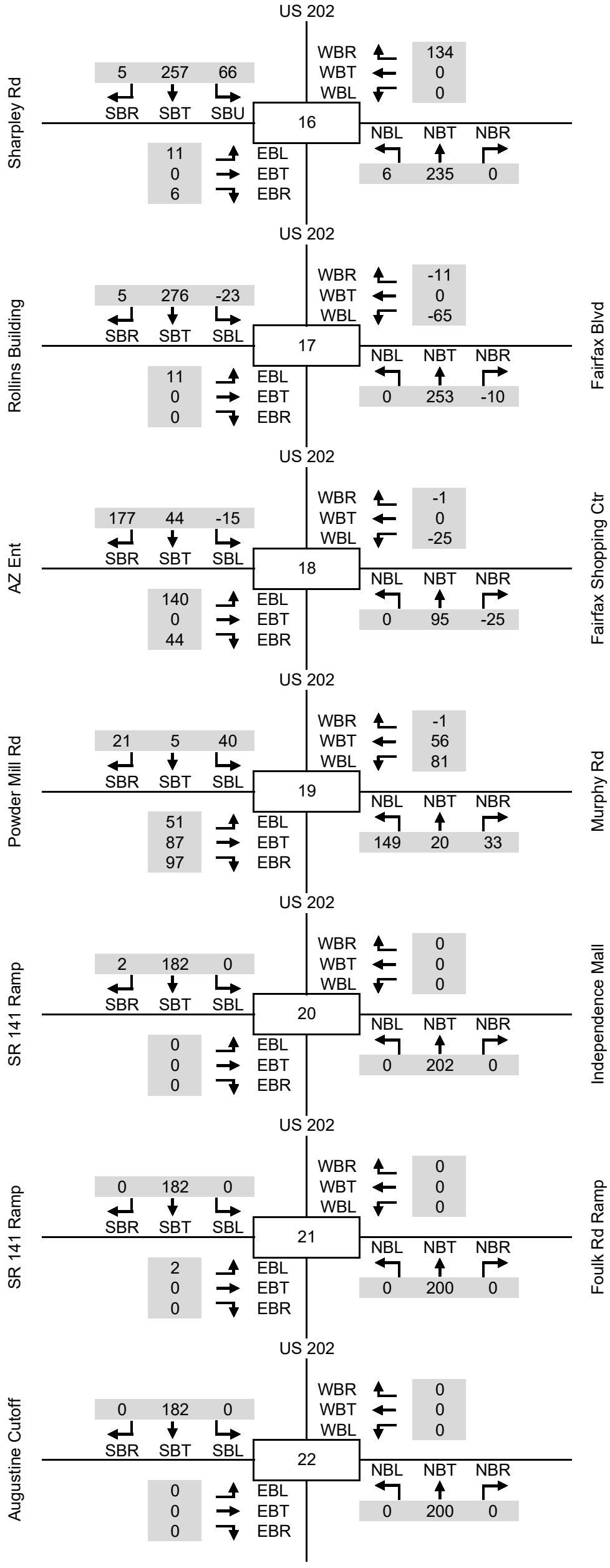

2050 Proposed Zoning High - AM Volume Growth

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

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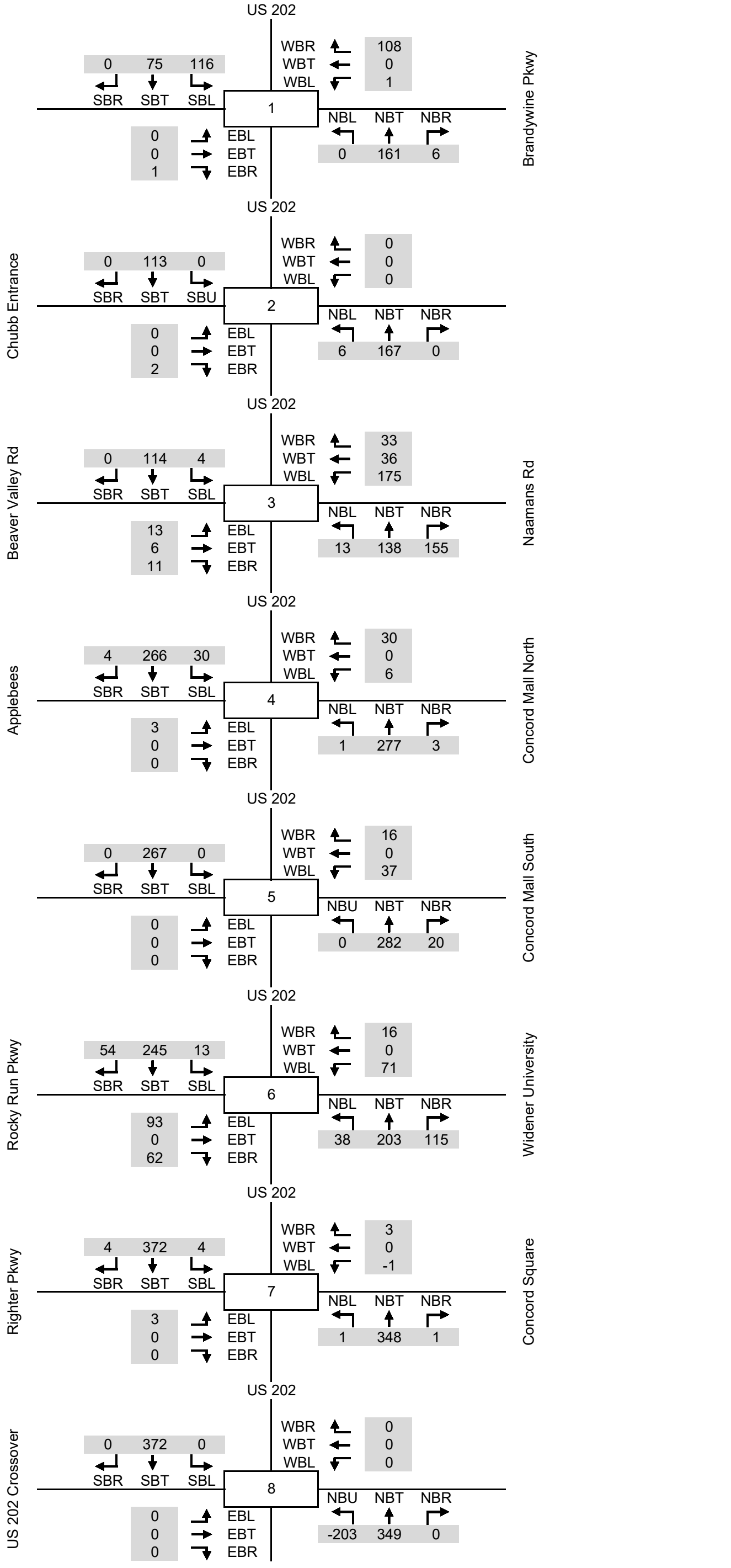

2050 Proposed Zoning High - AM Volume Growth

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

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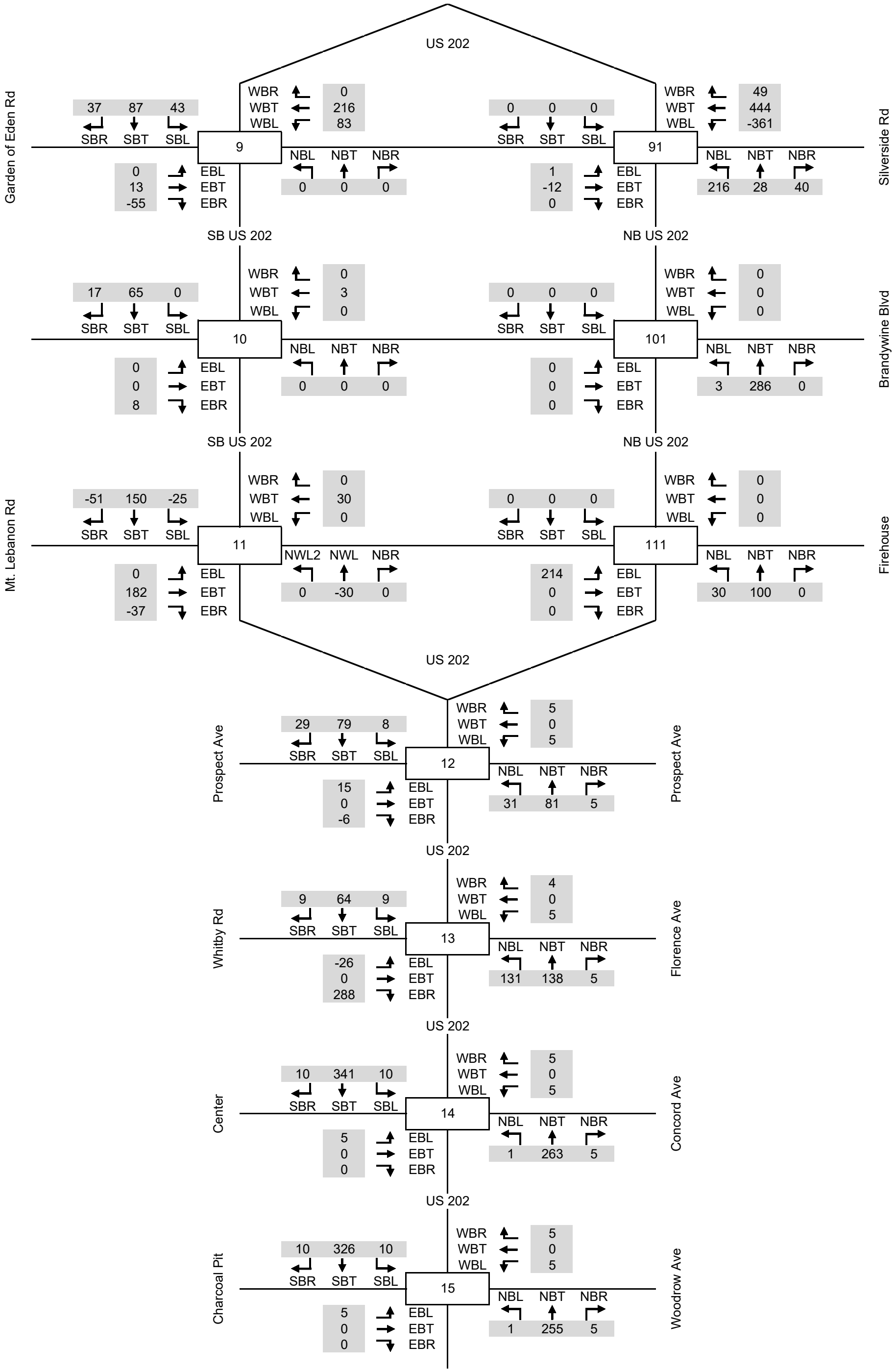

2050 Proposed Zoning High - AM Volume Growth

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

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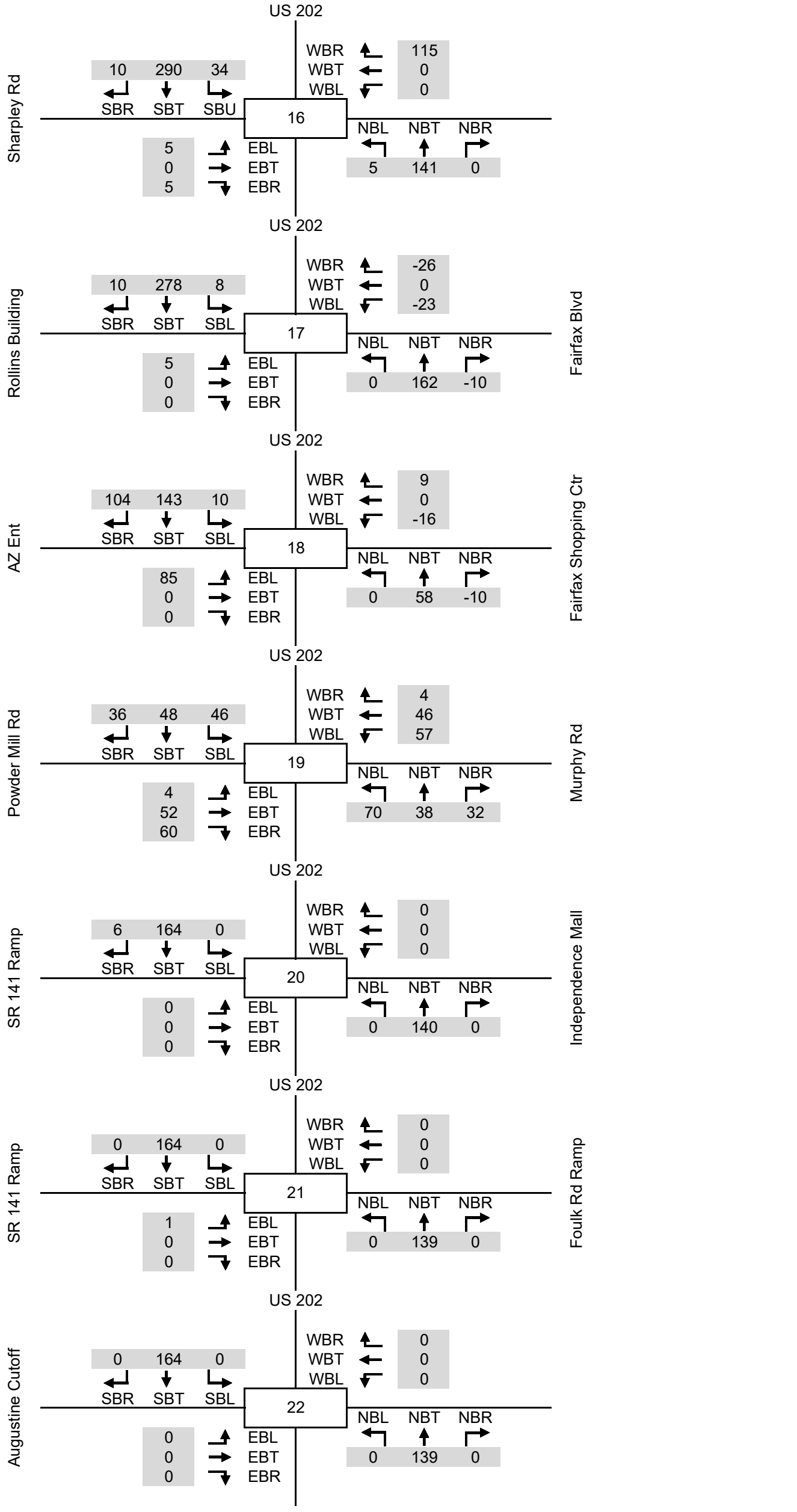

2050 Proposed Zoning High - PM Volume Growth

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

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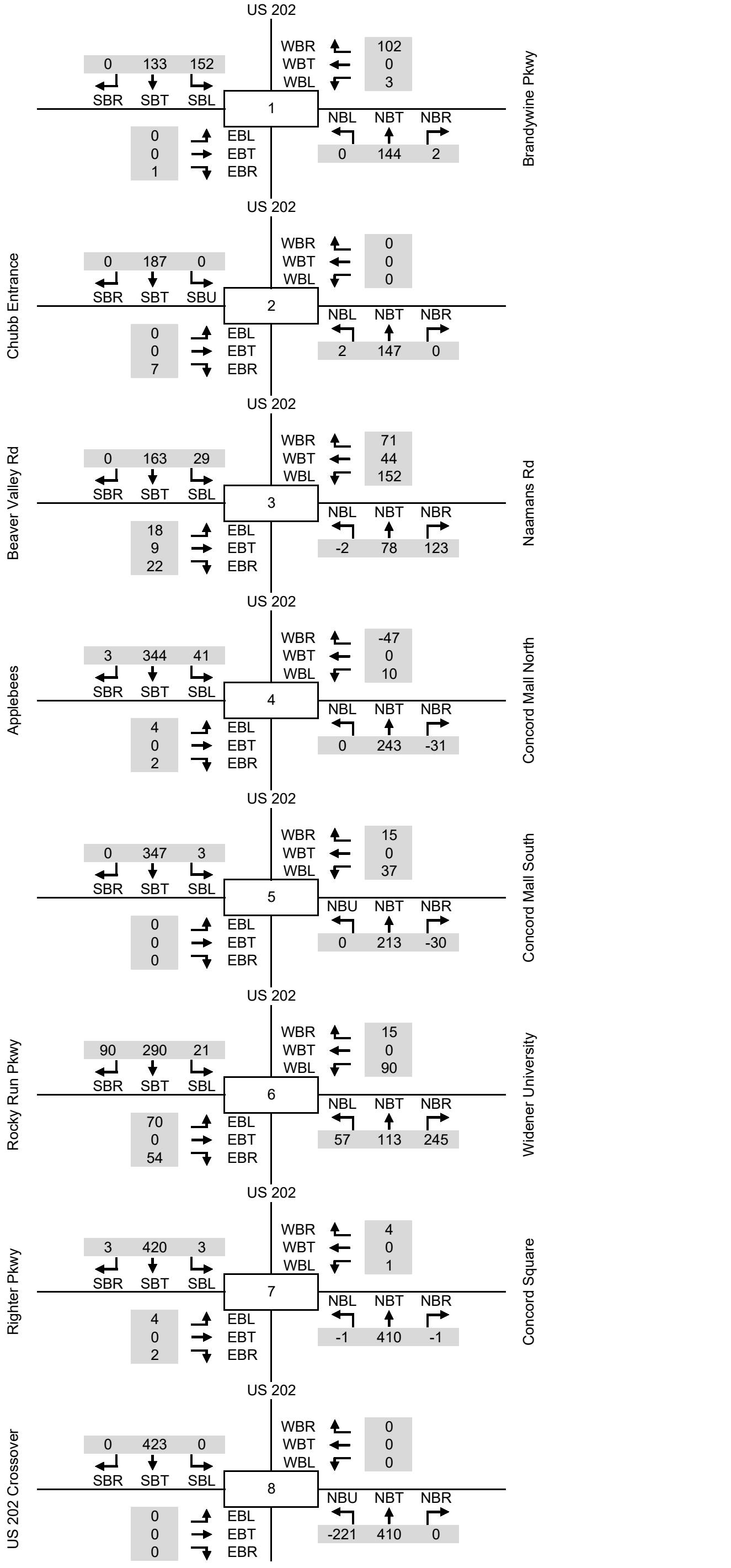

2050 Proposed Zoning High - PM Volume Growth

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

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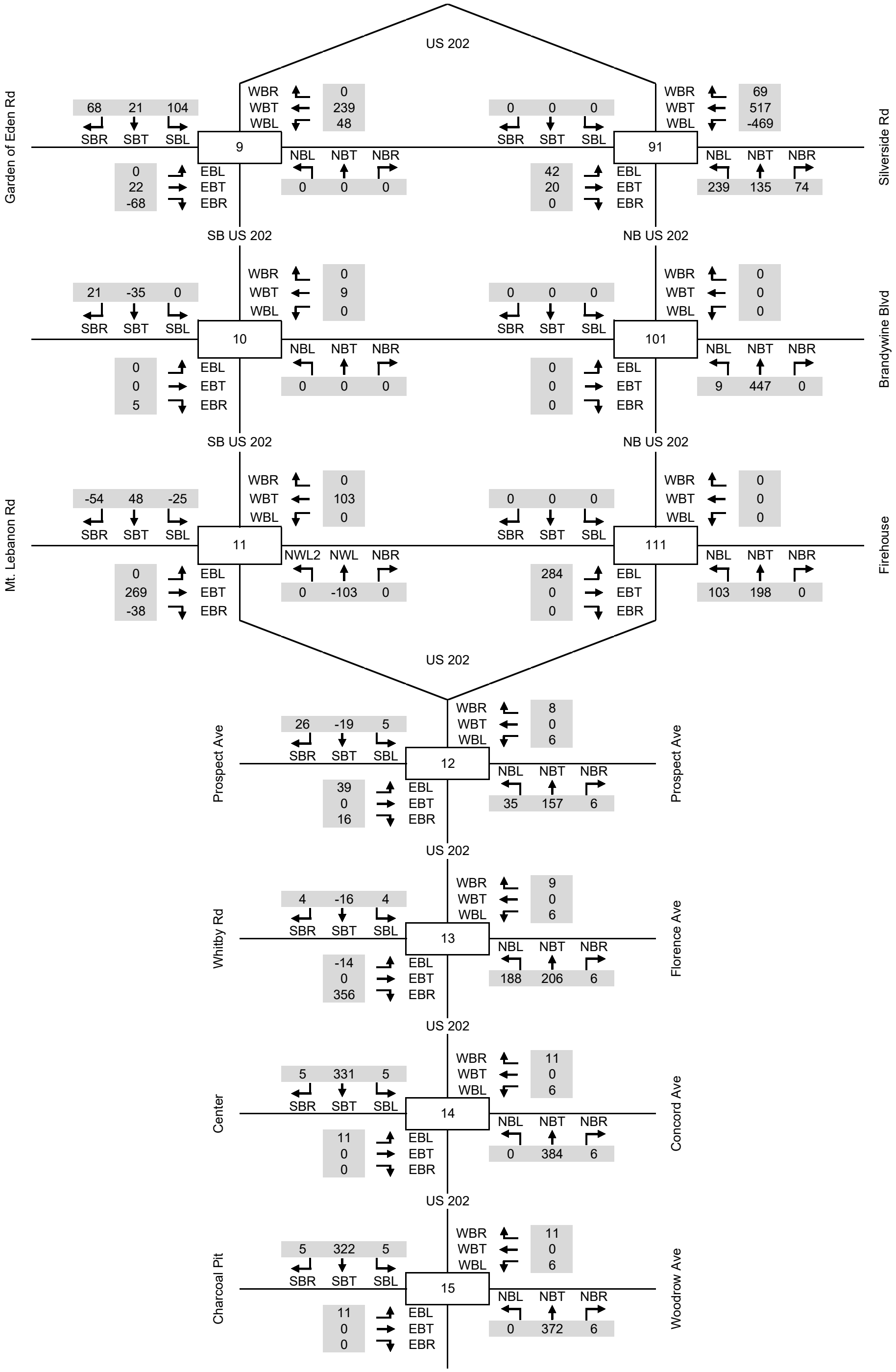

2050 Proposed Zoning High - PM Volume Growth

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

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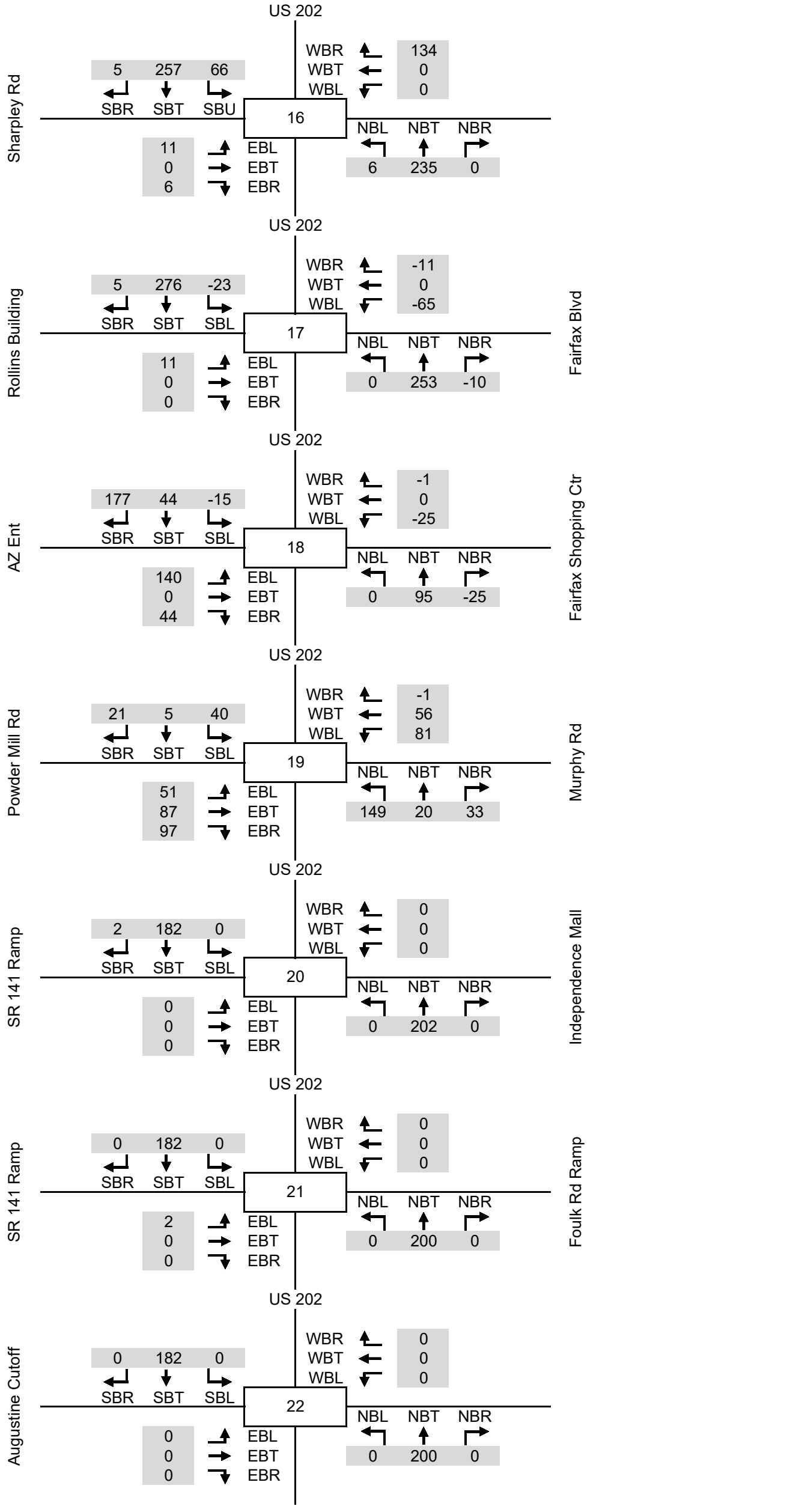

Appendix D

Scenario Volumes

2019 Existing Conditions - AM Volumes

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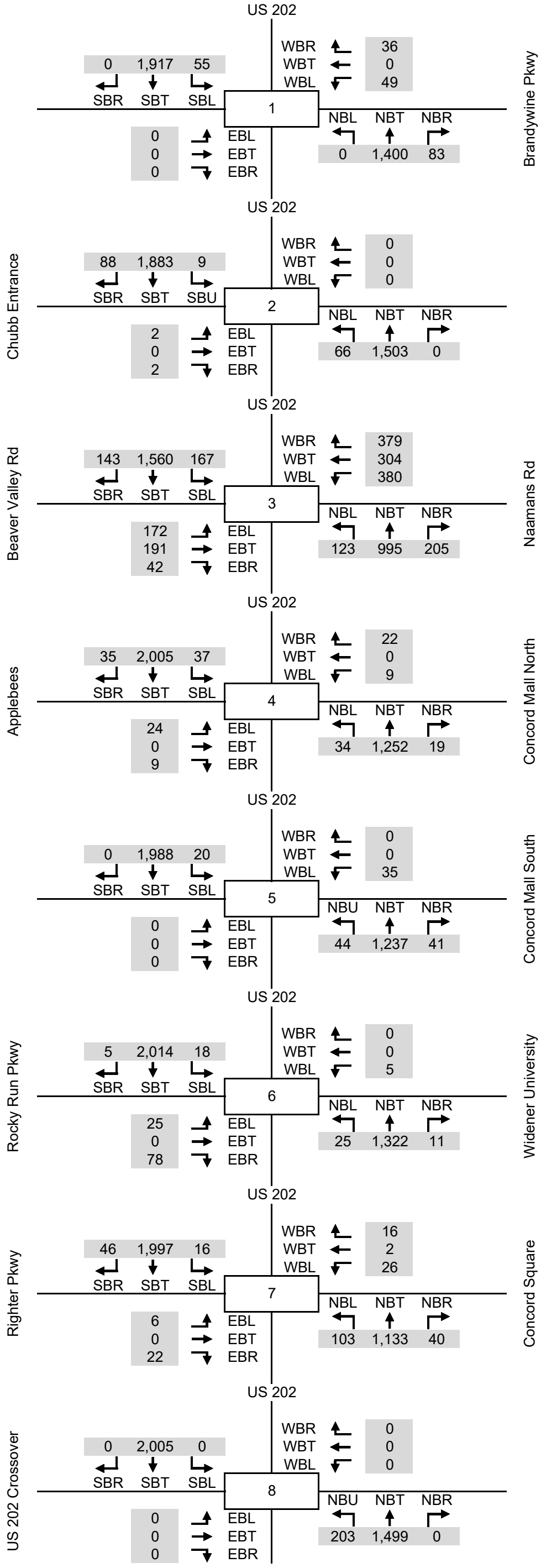
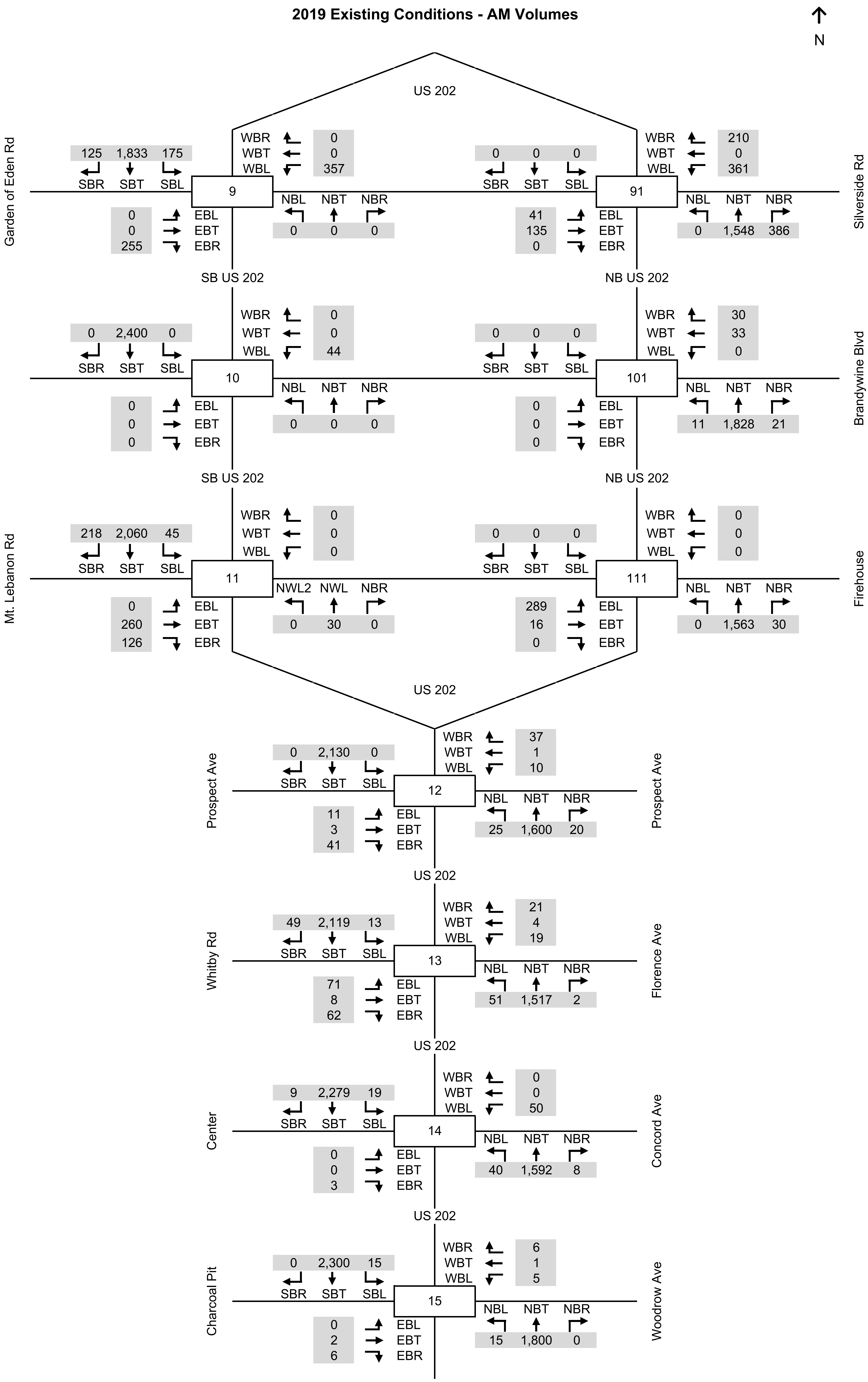


2019 Existing Conditions - AM Volumes



2019 Existing Conditions - AM Volumes

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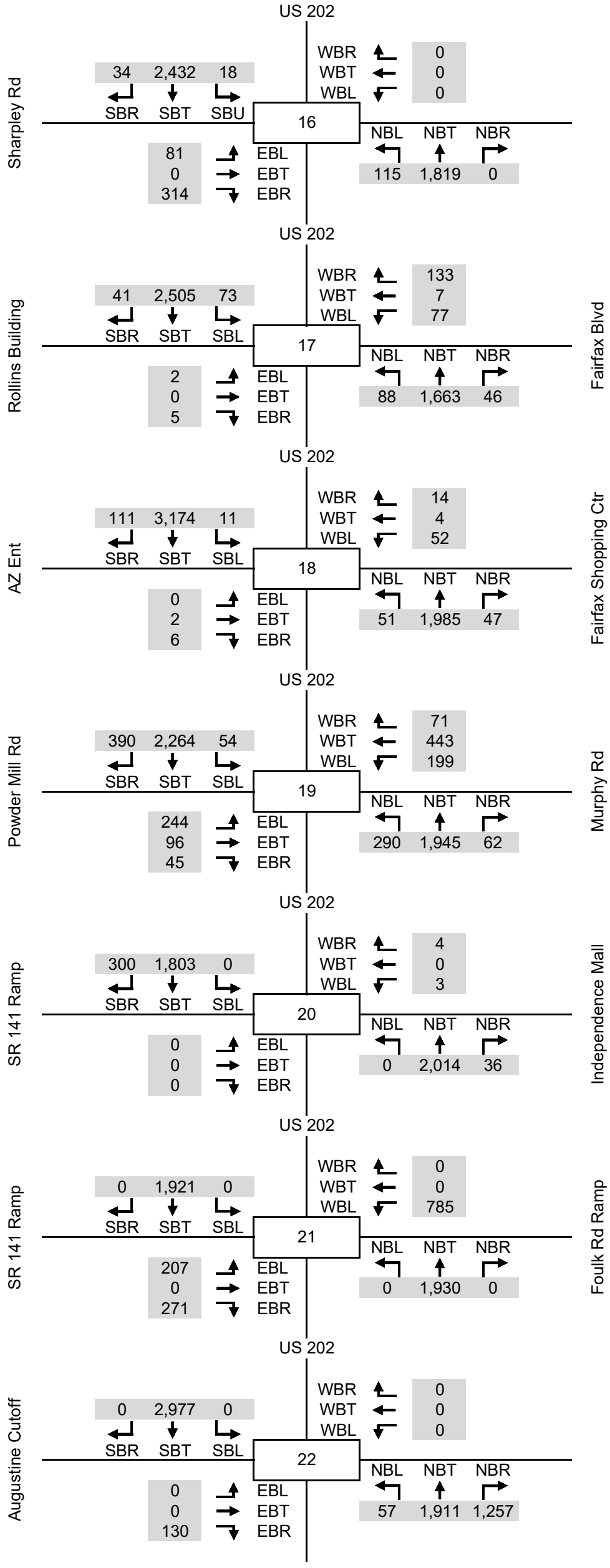

2019 Existing Conditions - PM Volumes

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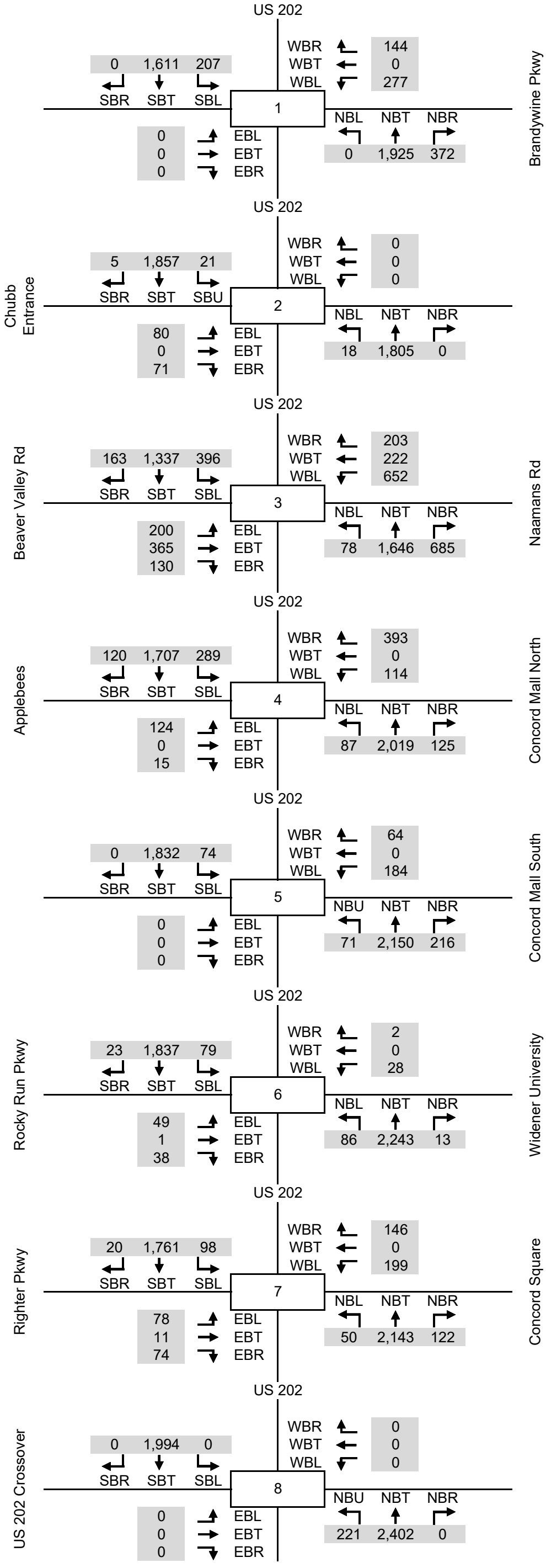
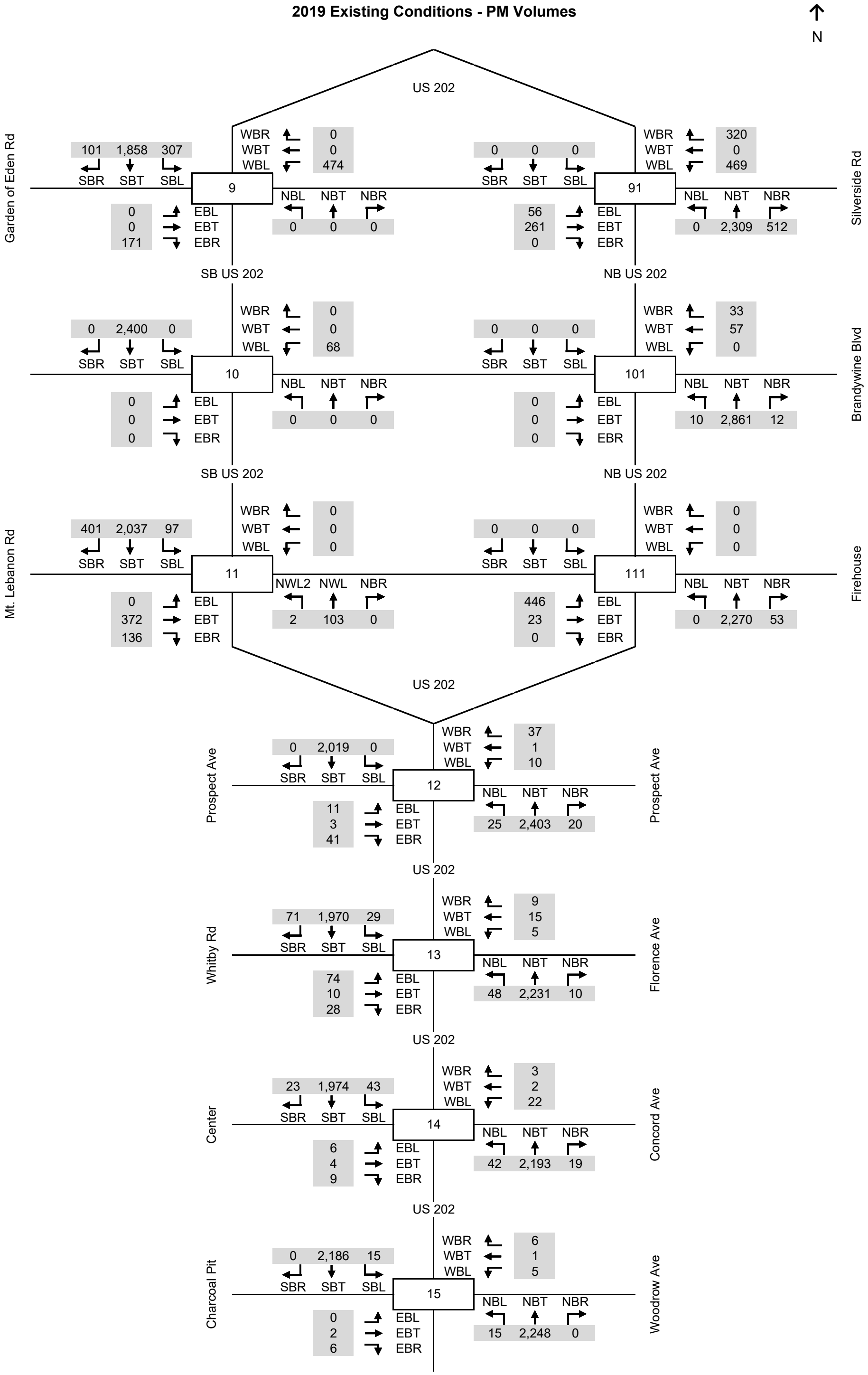


2019 Existing Conditions - PM Volumes



2019 Existing Conditions - PM Volumes

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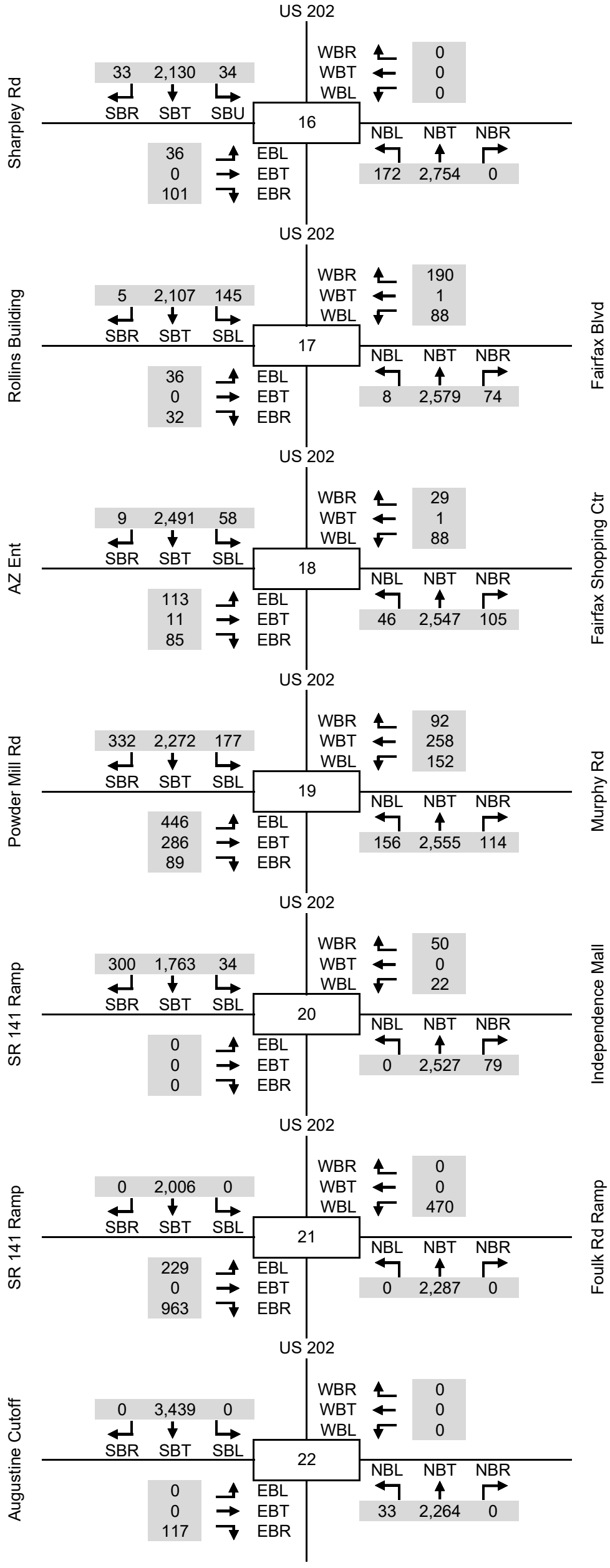

2050 Baseline - AM Volumes

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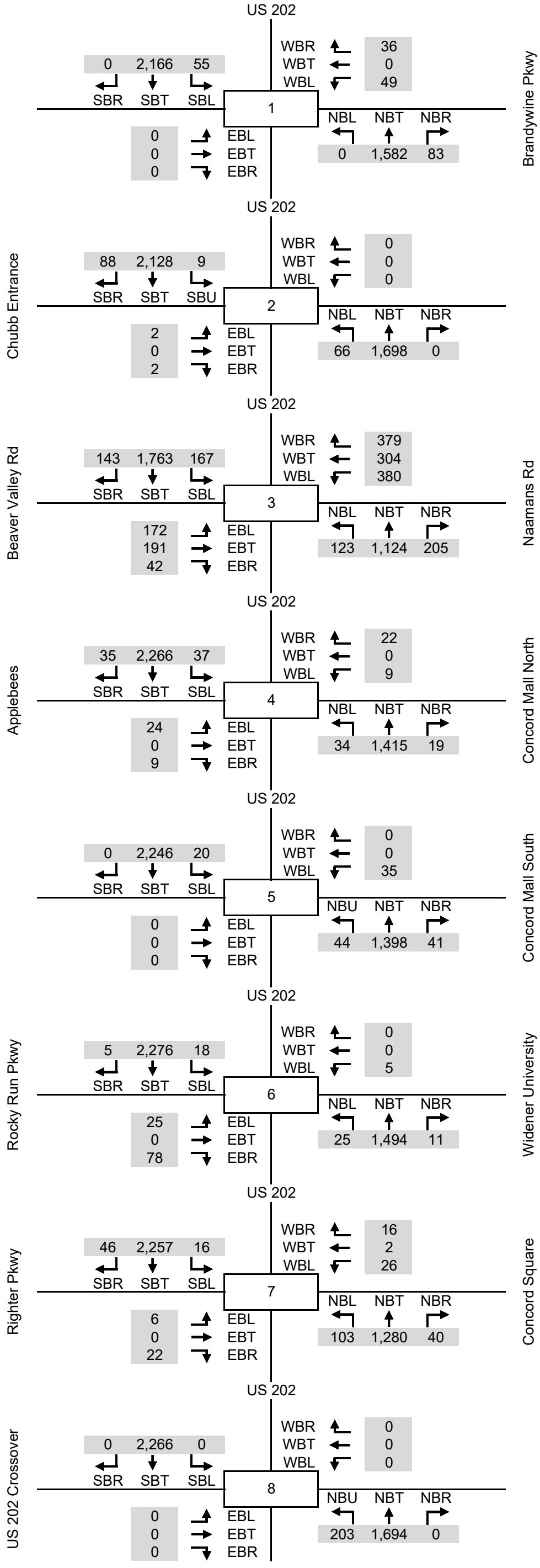

2050 Baseline - AM Volumes

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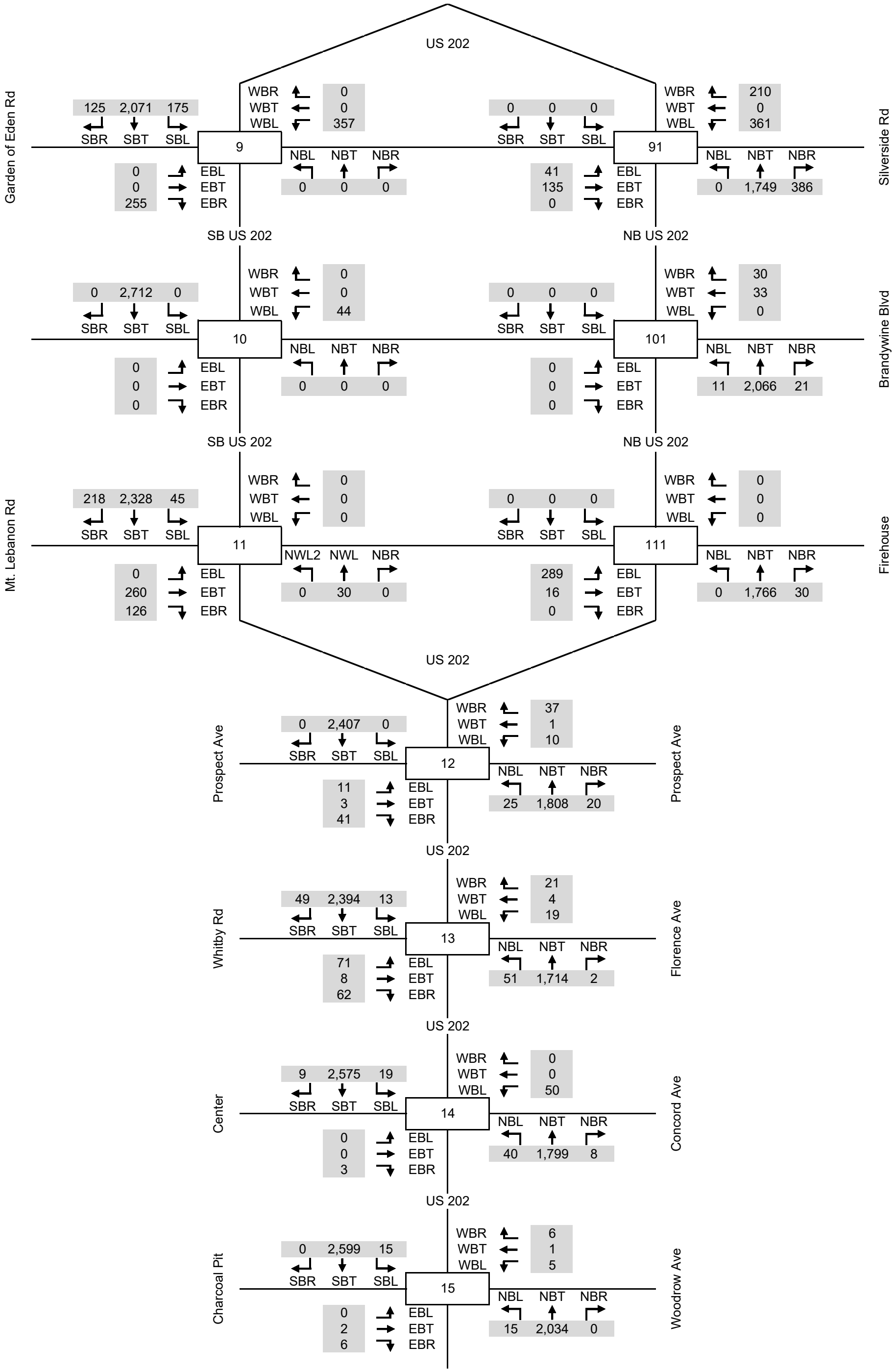

2050 Baseline - AM Volumes

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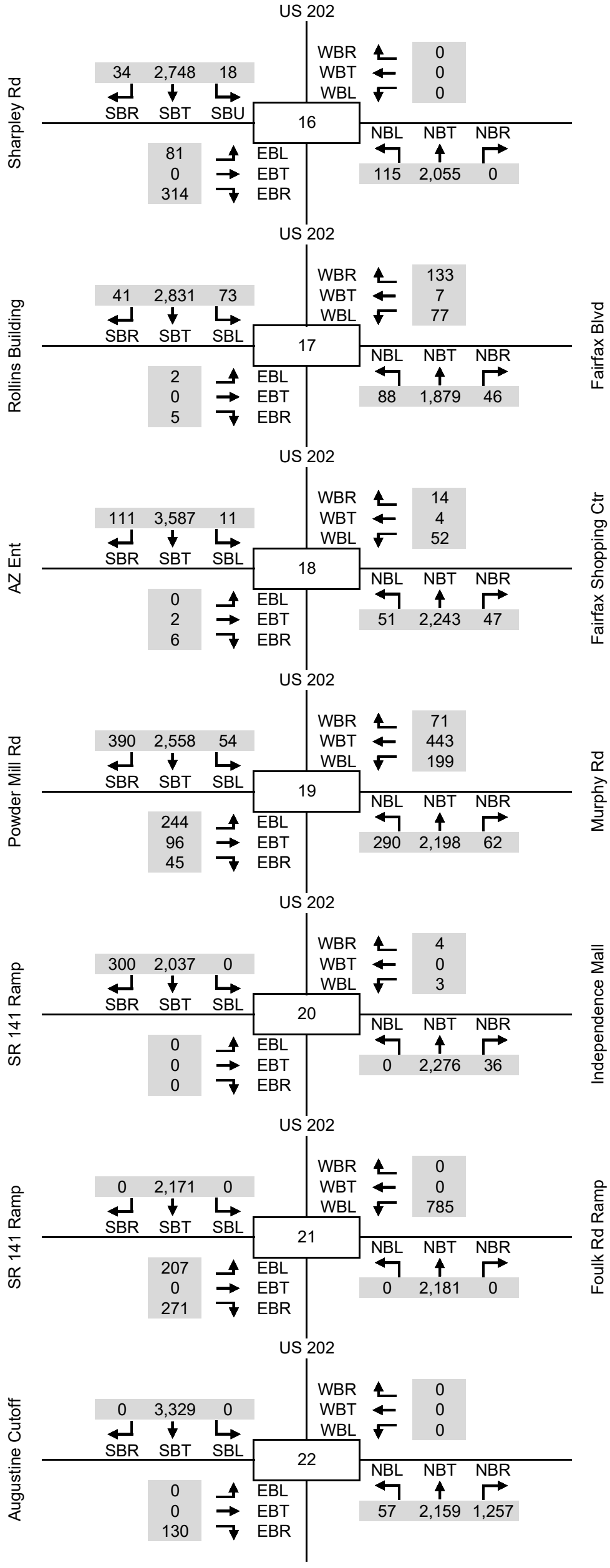

2050 Baseline - PM Volumes

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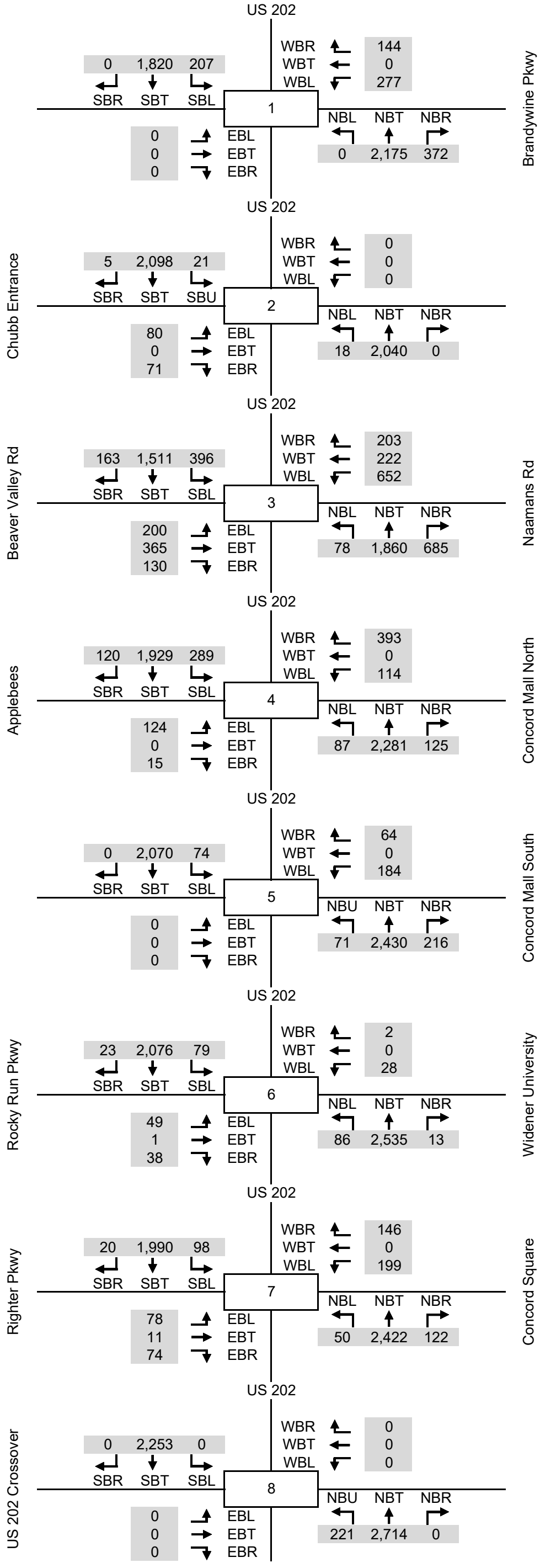
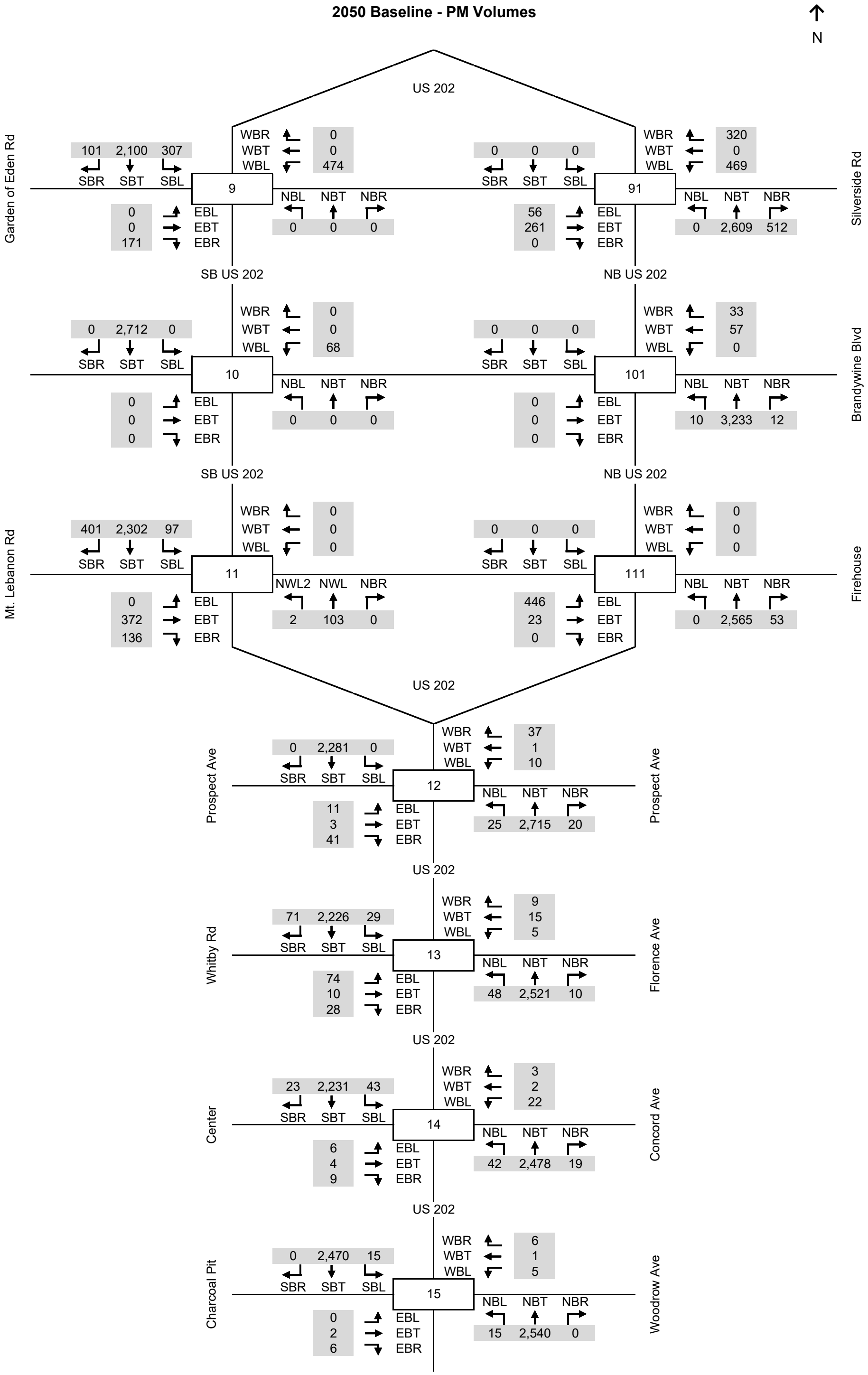


2050 Baseline - PM Volumes



2050 Baseline - PM Volumes

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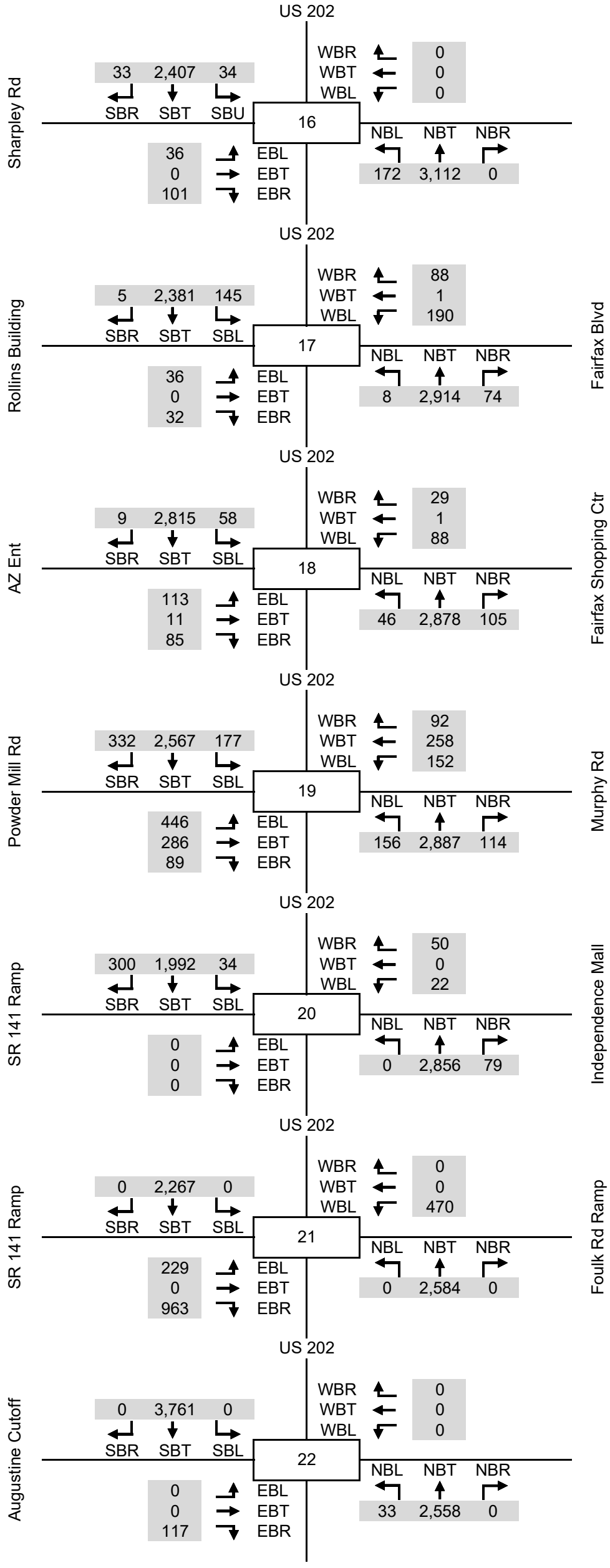

2050 By-right Development - AM Volumes

Exiting Transportation Infrastructure

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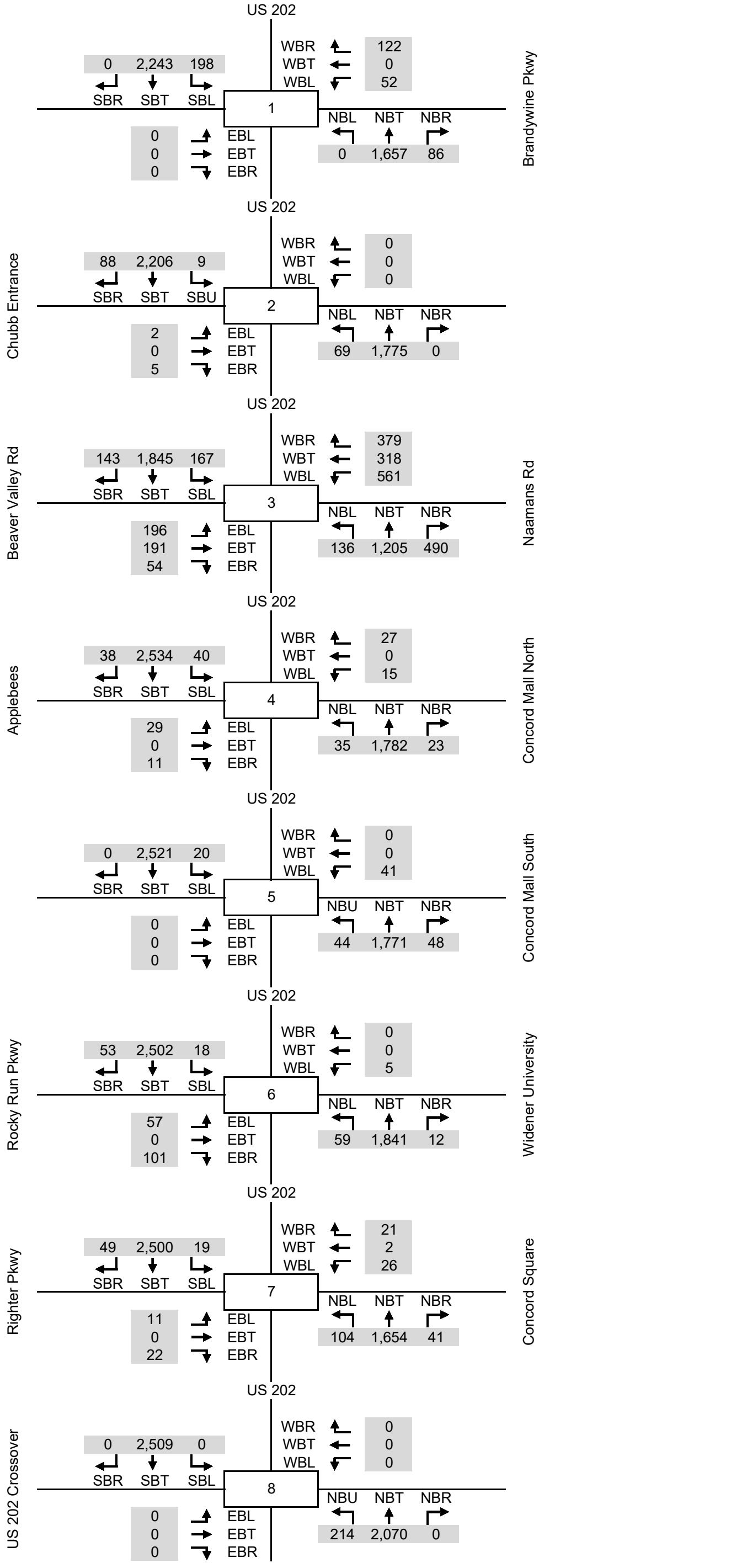

2050 By-right Development - AM Volumes
Exiting Transportation Infrastructure

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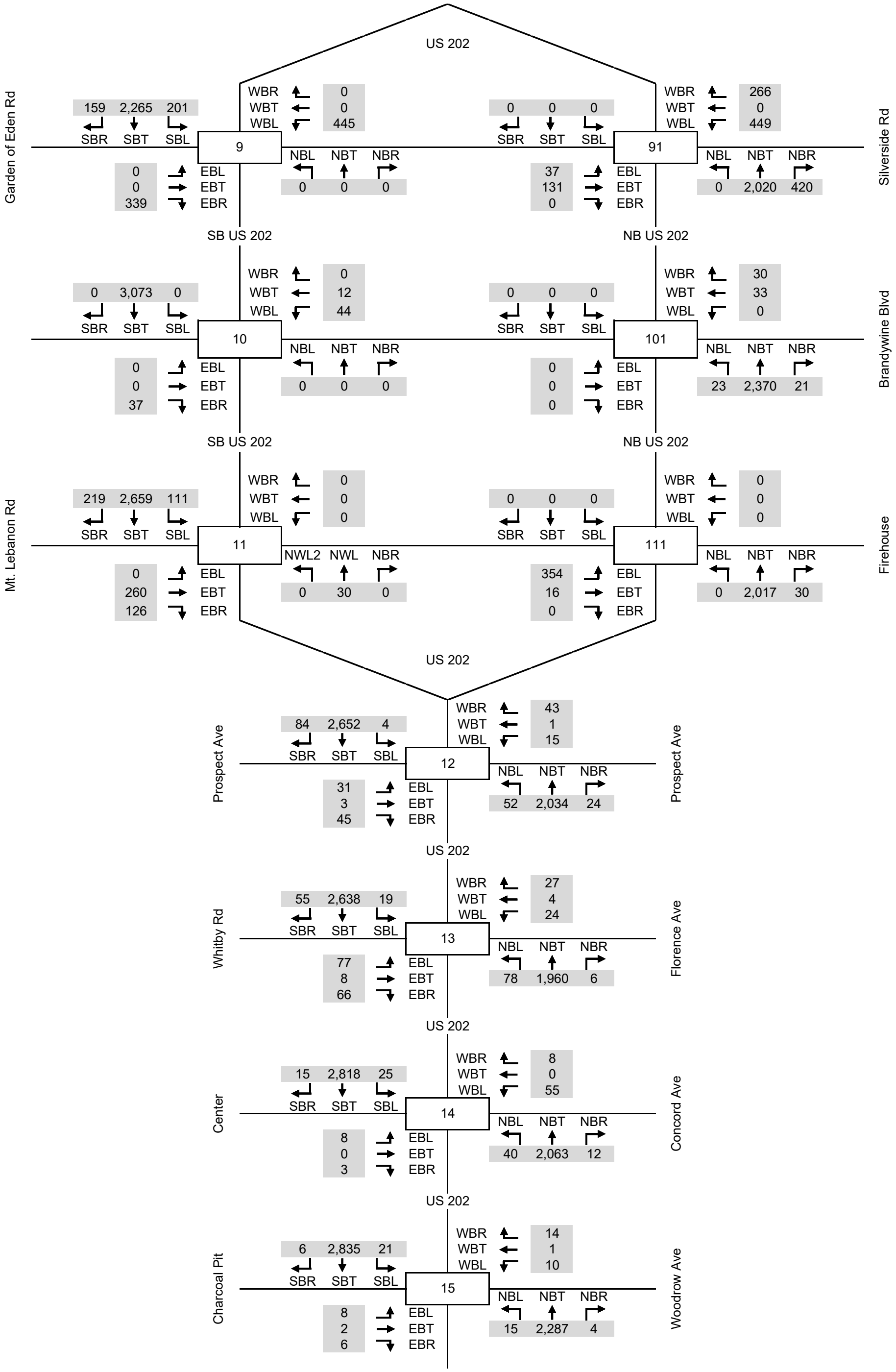
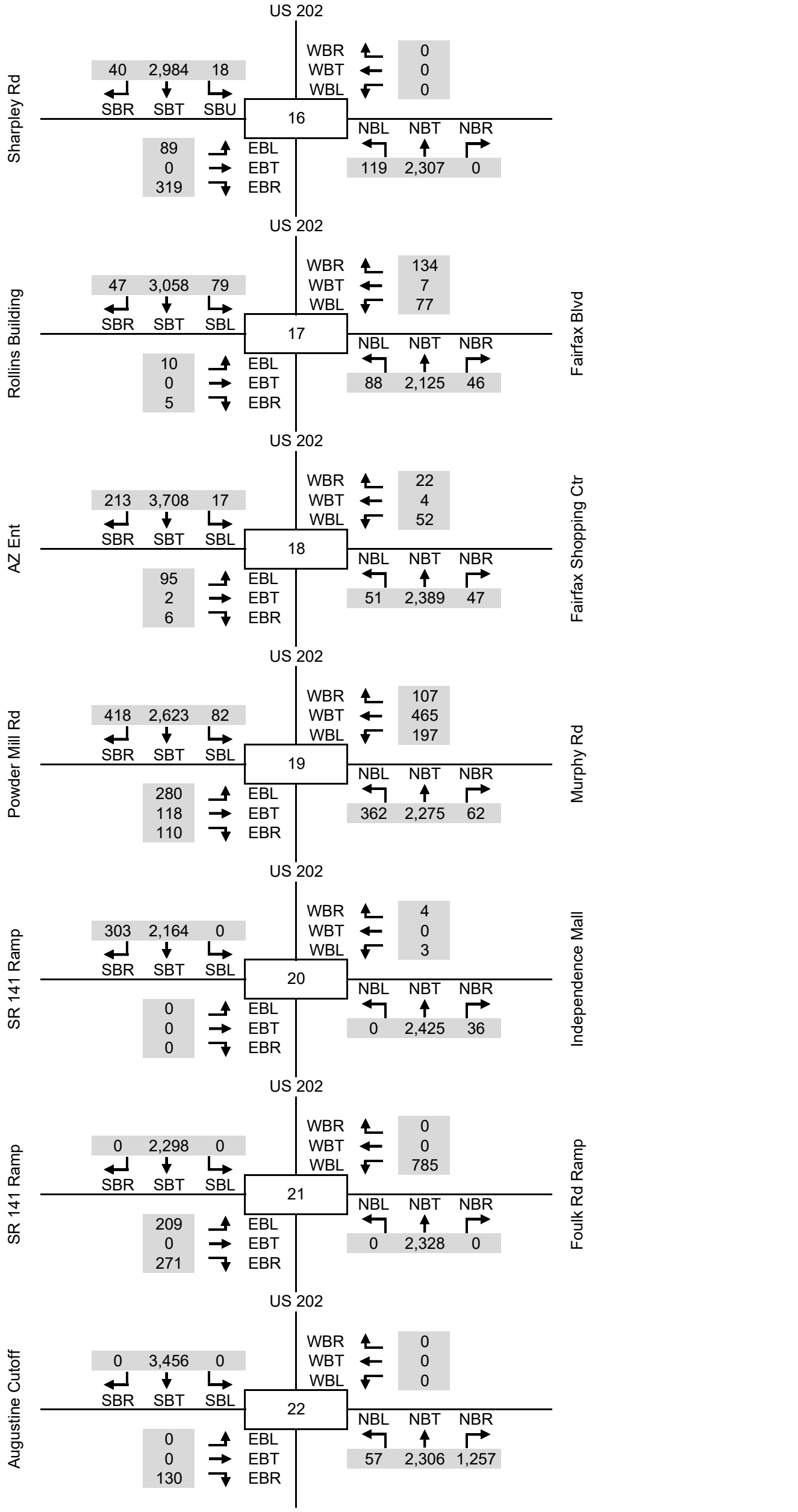


2050 By-right Development - AM Volumes

Exiting Transportation Infrastructure

N



2050 By-right Development - PM Volumes

Exiting Transportation Infrastructure

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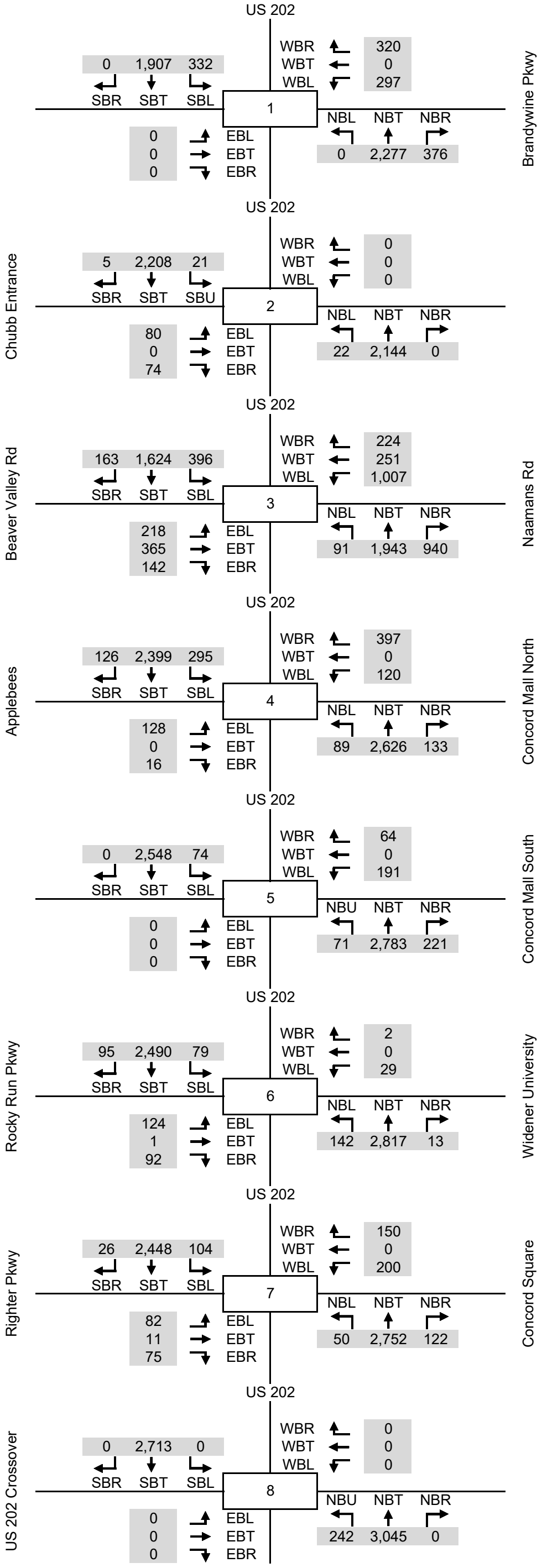
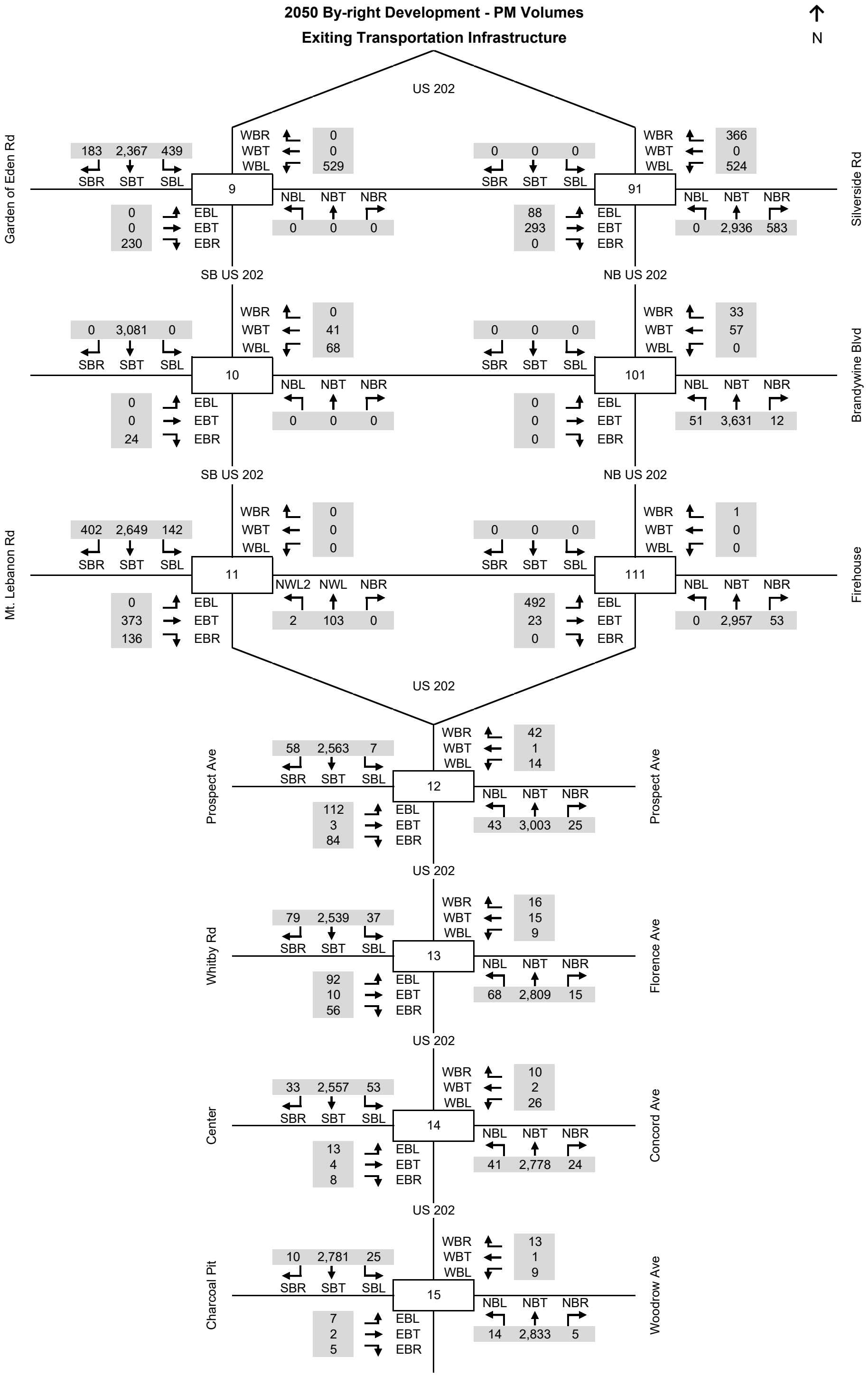


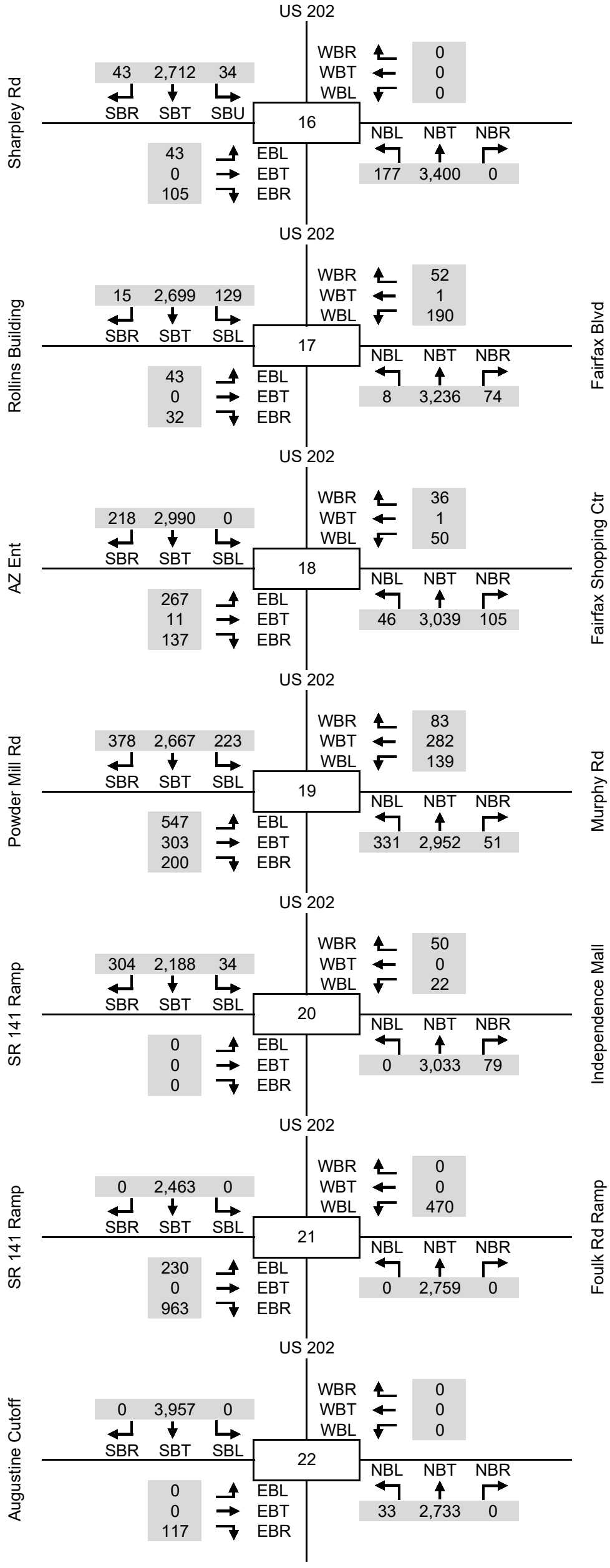
2050 By-right Development - PM Volumes
Exiting Transportation Infrastructure



2050 By-right Development - PM Volumes

Exiting Transportation Infrastructure

N



2050 By-right Development - AM Volumes

Additional Roadway Connections

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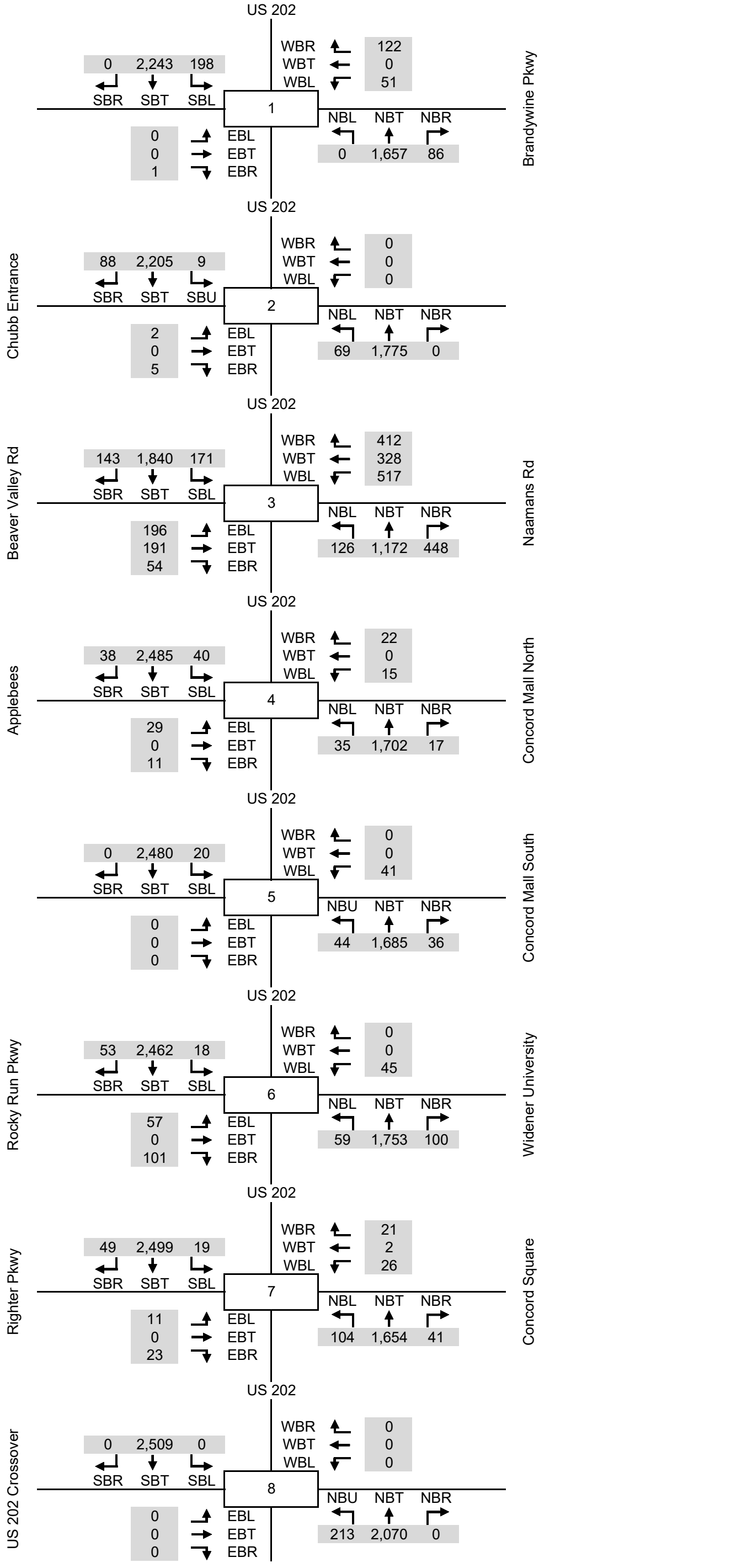

2050 By-right Development - AM Volumes

Additional Roadway Connections

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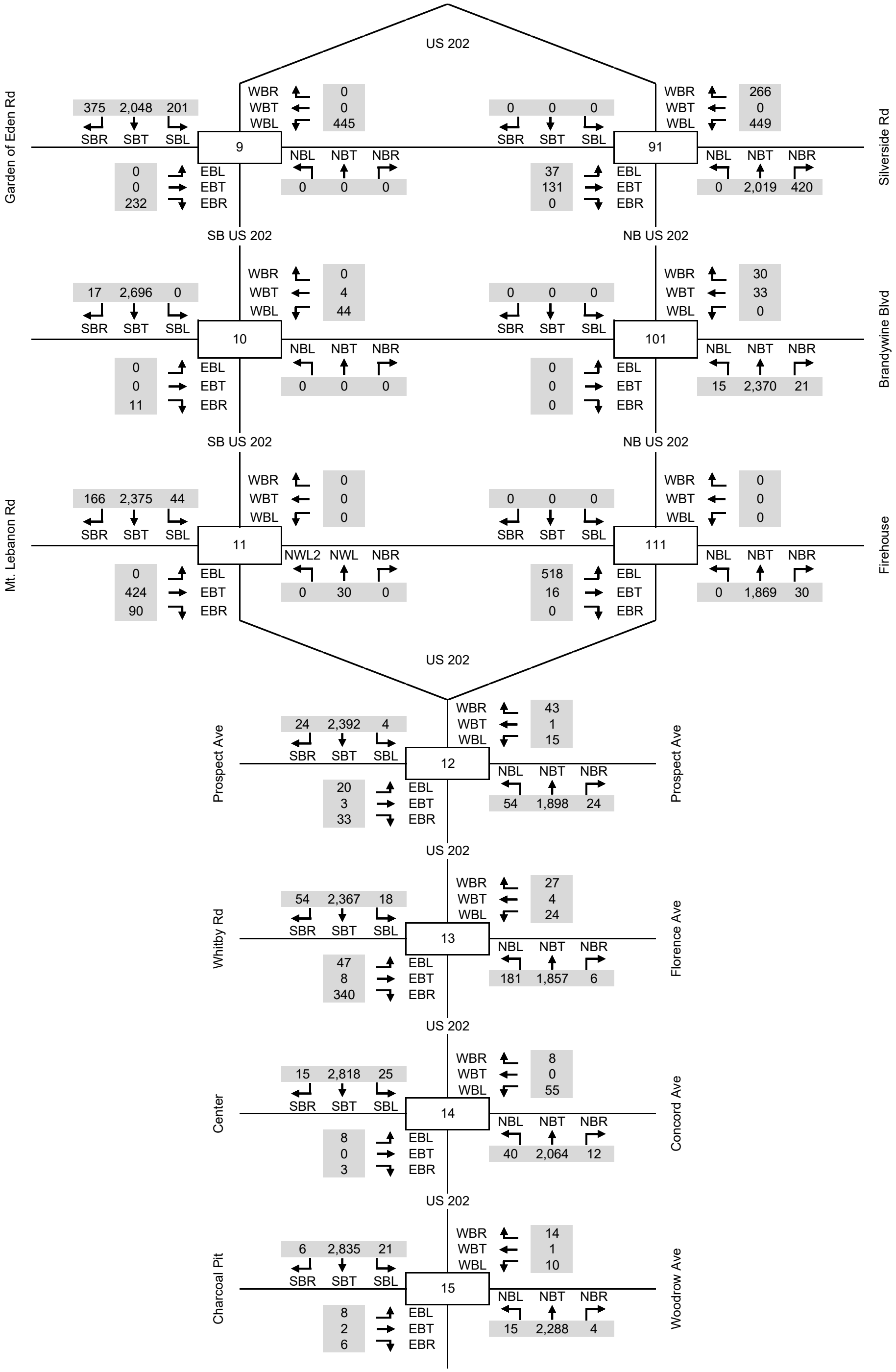

2050 By-right Development - AM Volumes

Additional Roadway Connections

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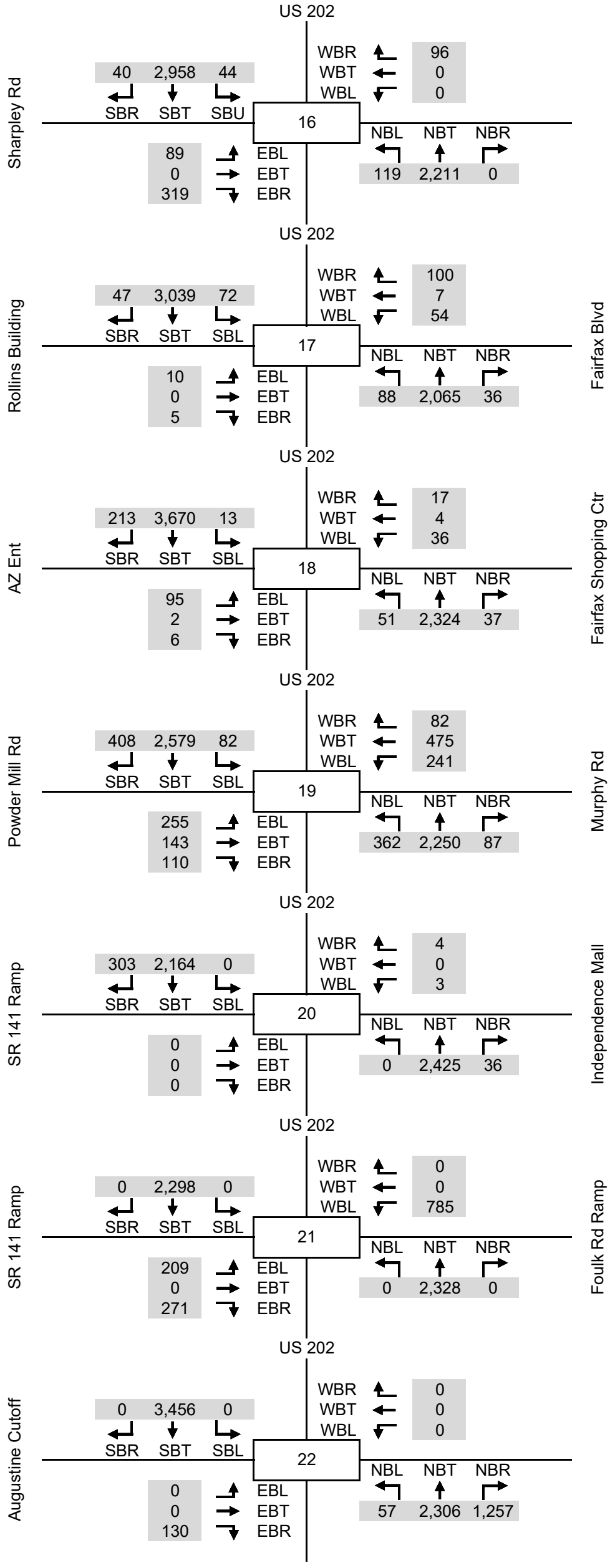

2050 By-right Development - PM Volumes

Additional Roadway Connections

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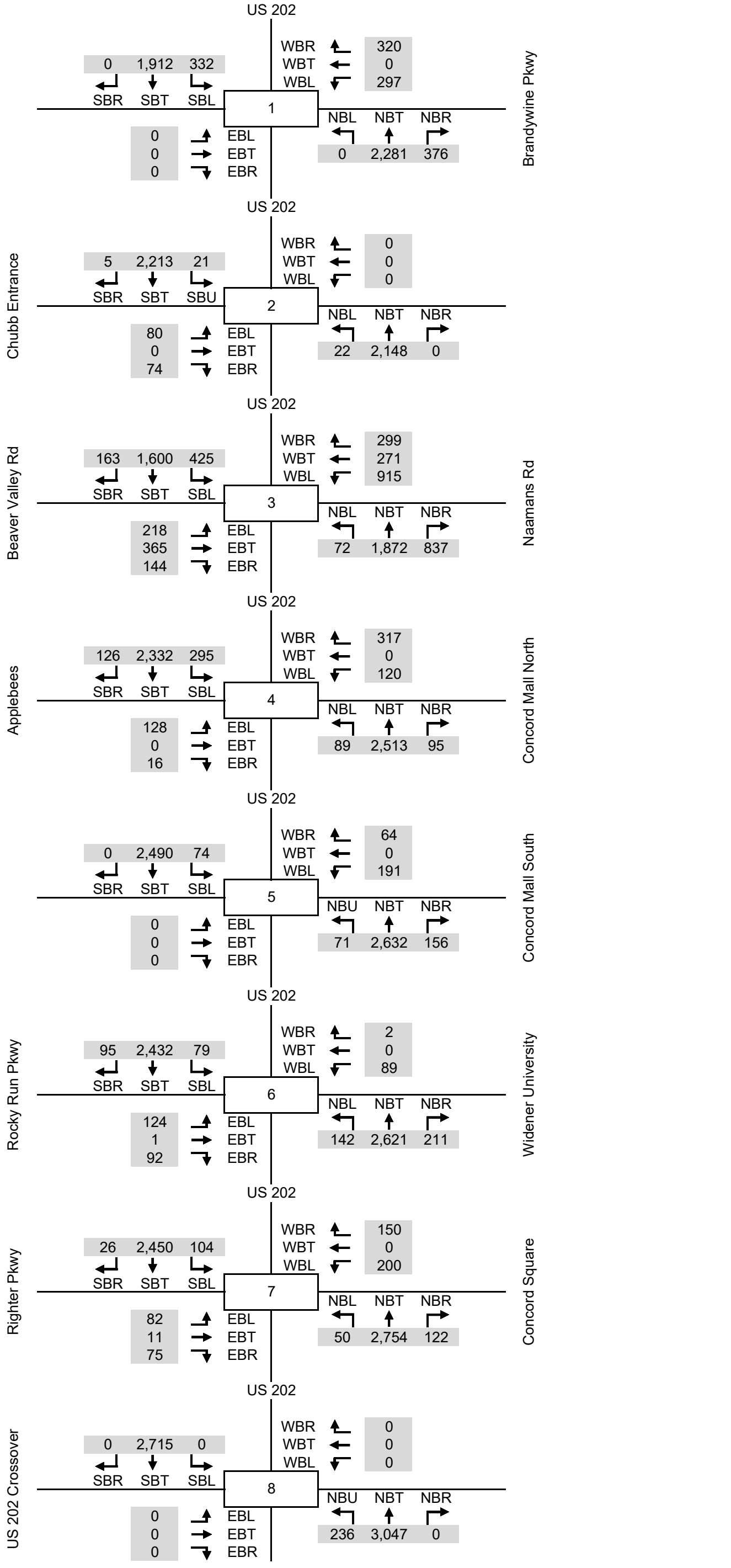

2050 By-right Development - PM Volumes

Additional Roadway Connections

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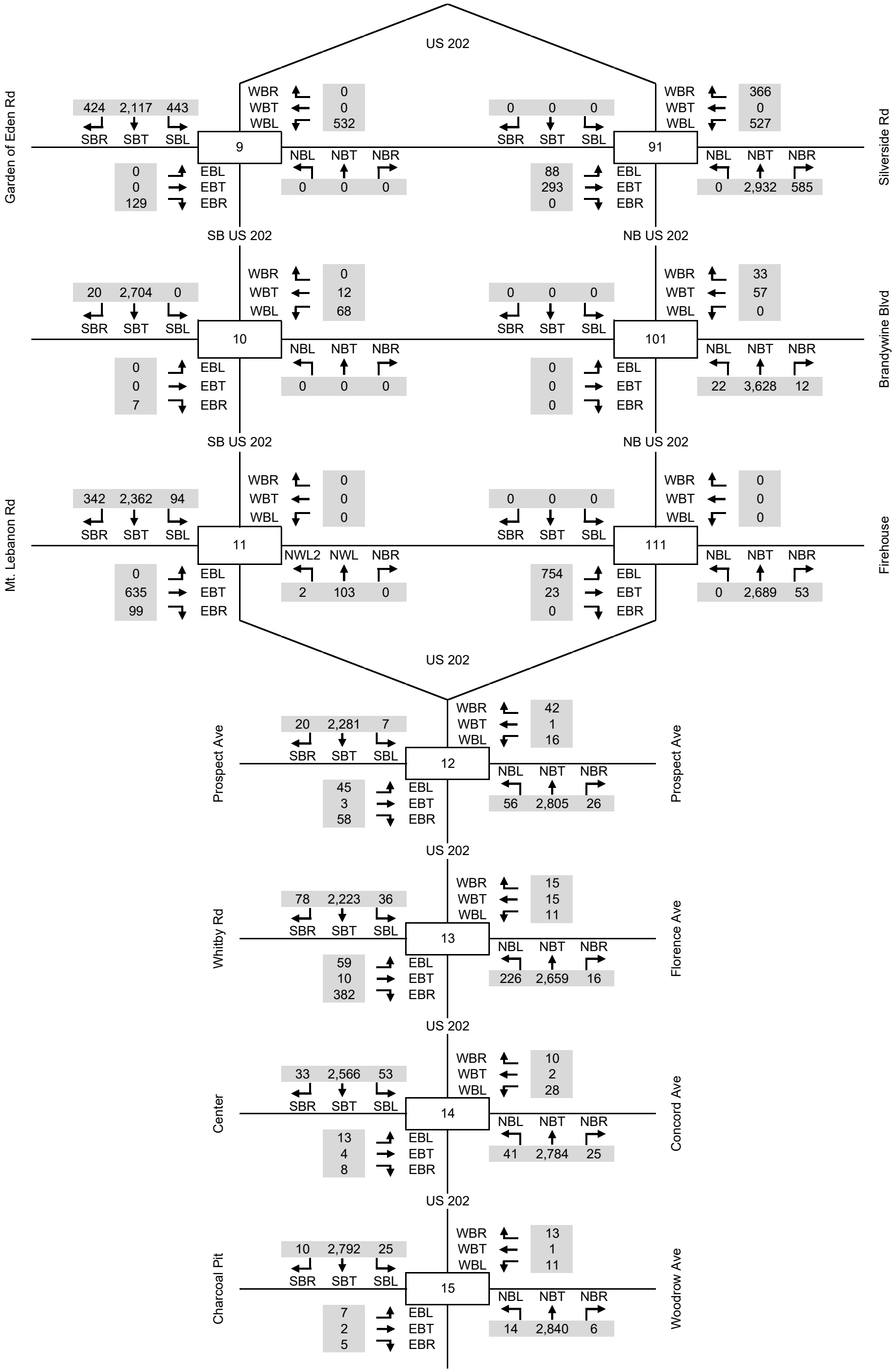

2050 By-right Development - PM Volumes

Additional Roadway Connections

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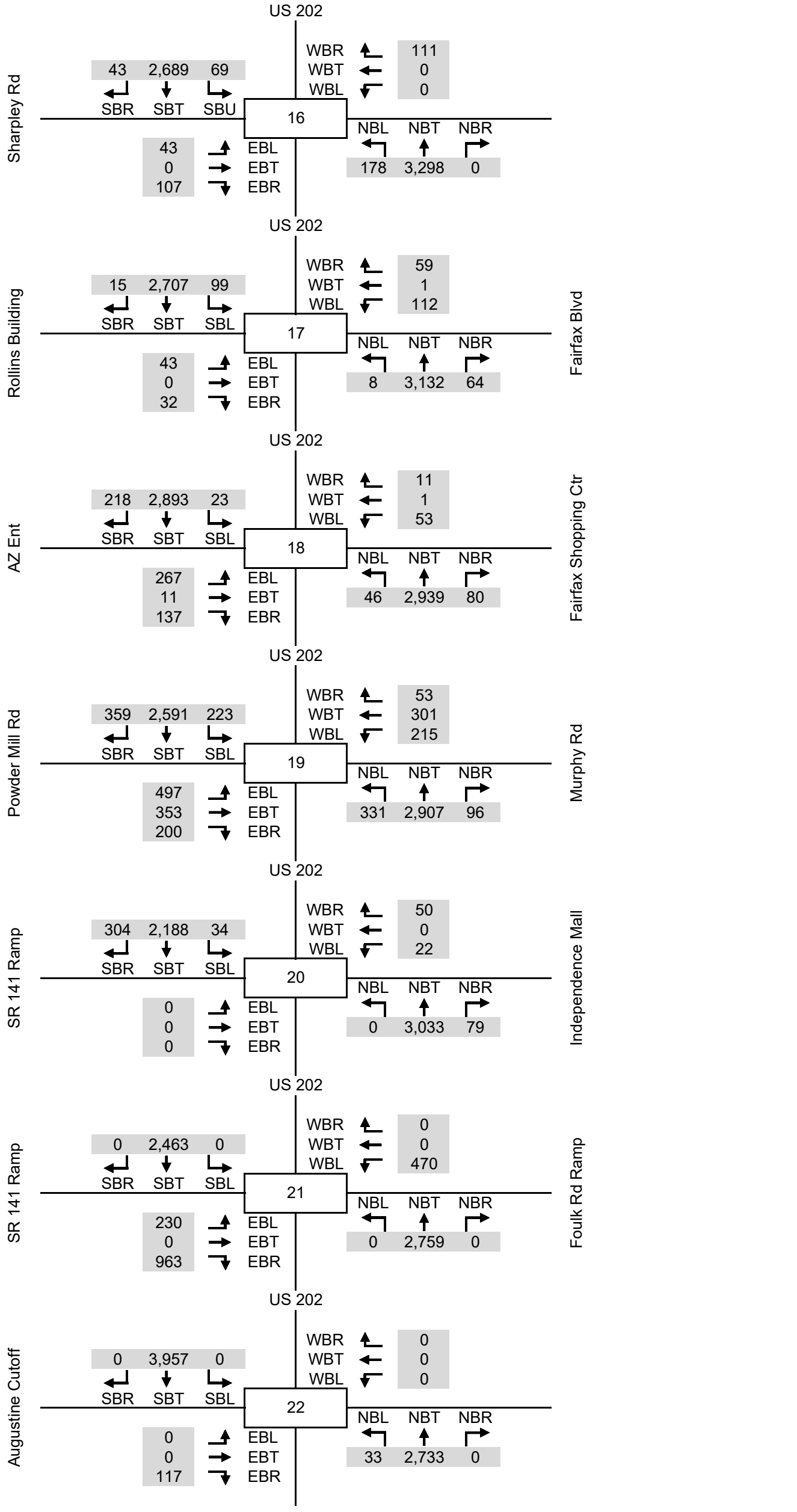

2050 By-right Development - AM Volumes

Additional Roadway and Ped/Bike Connections

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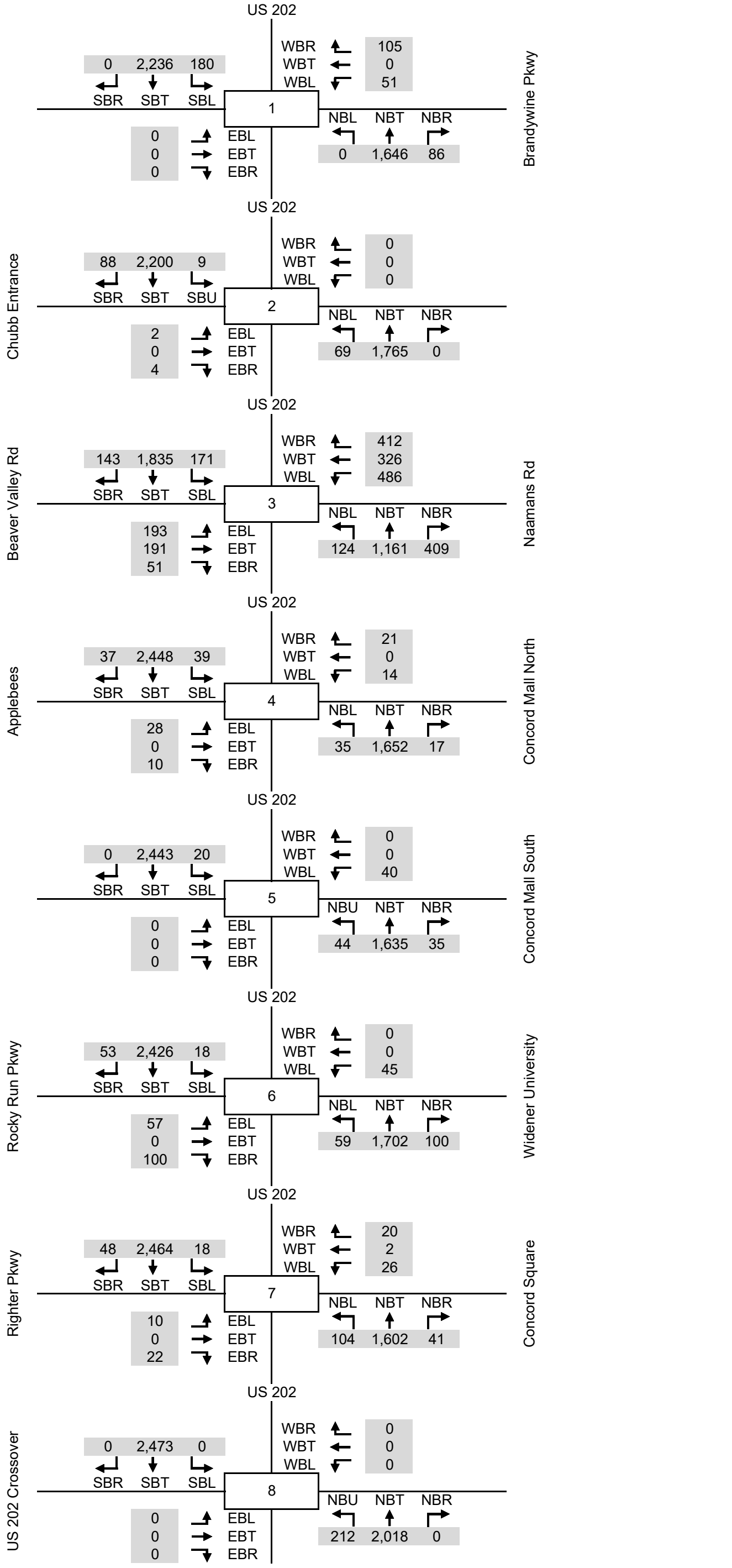

2050 By-right Development - AM Volumes

Additional Roadway and Ped/Bike Connections

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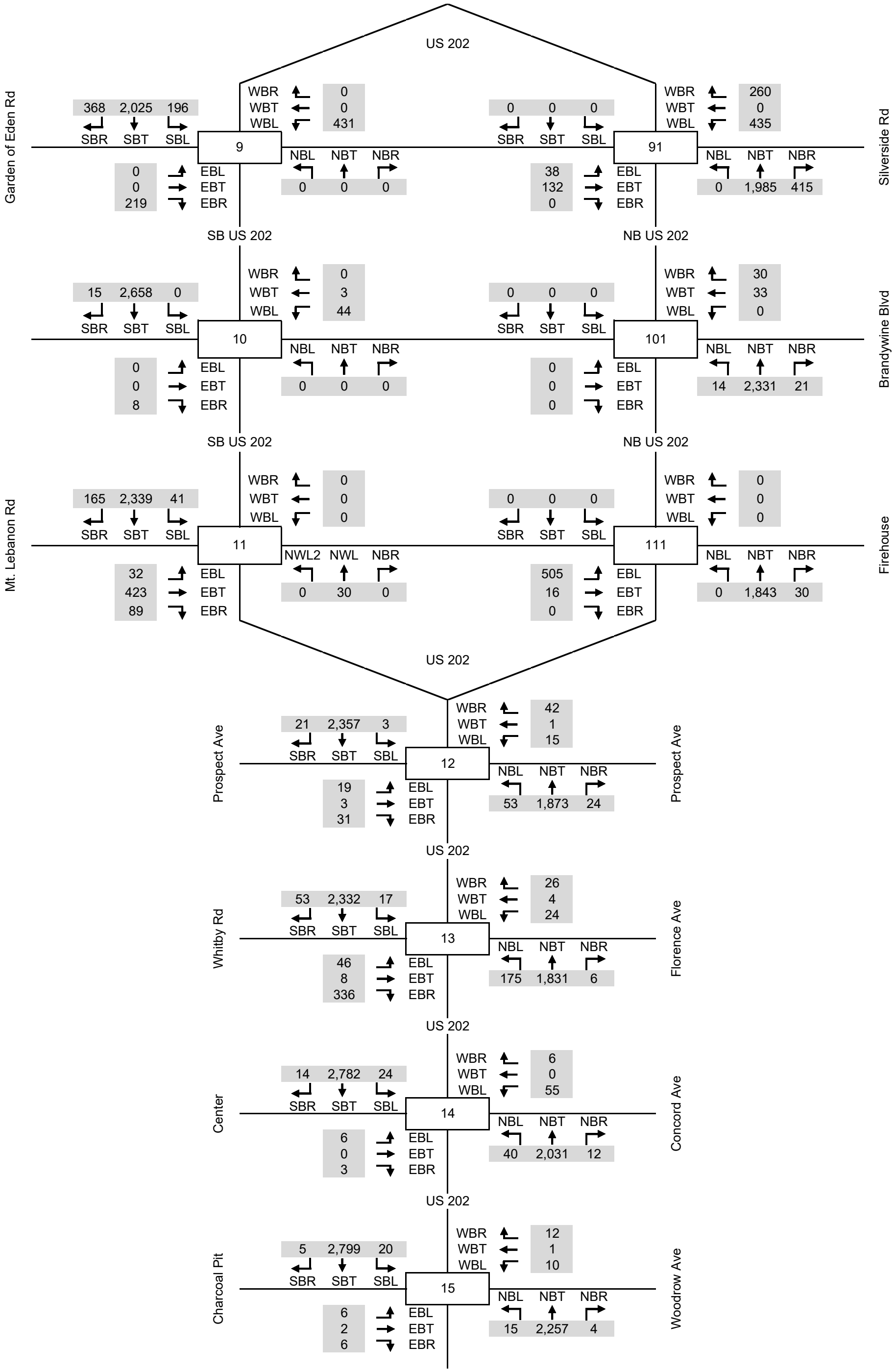
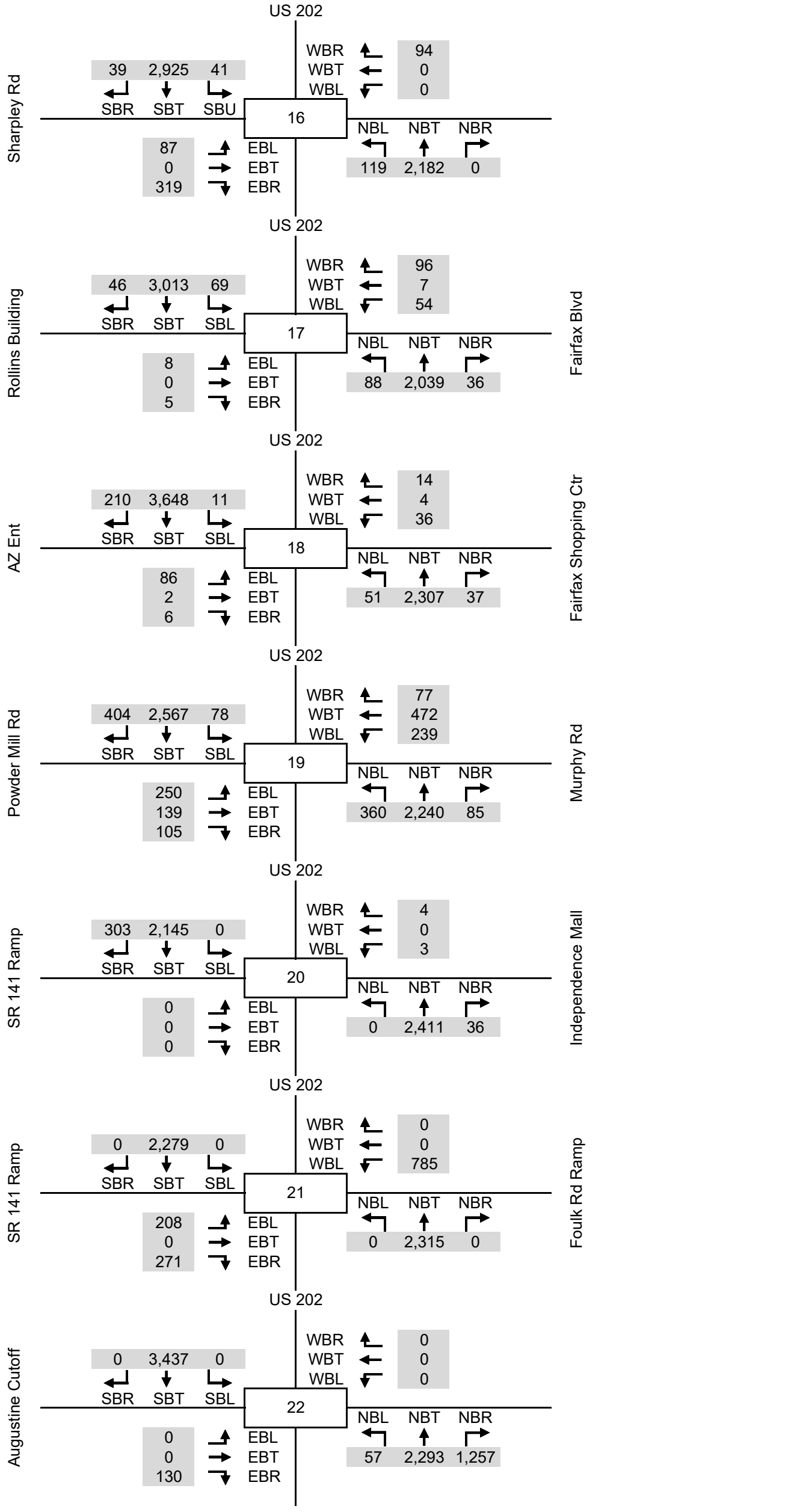


2050 By-right Development - AM Volumes

Additional Roadway and Ped/Bike Connections

N



2050 By-right Development - PM Volumes

Additional Roadway and Ped/Bike Connections

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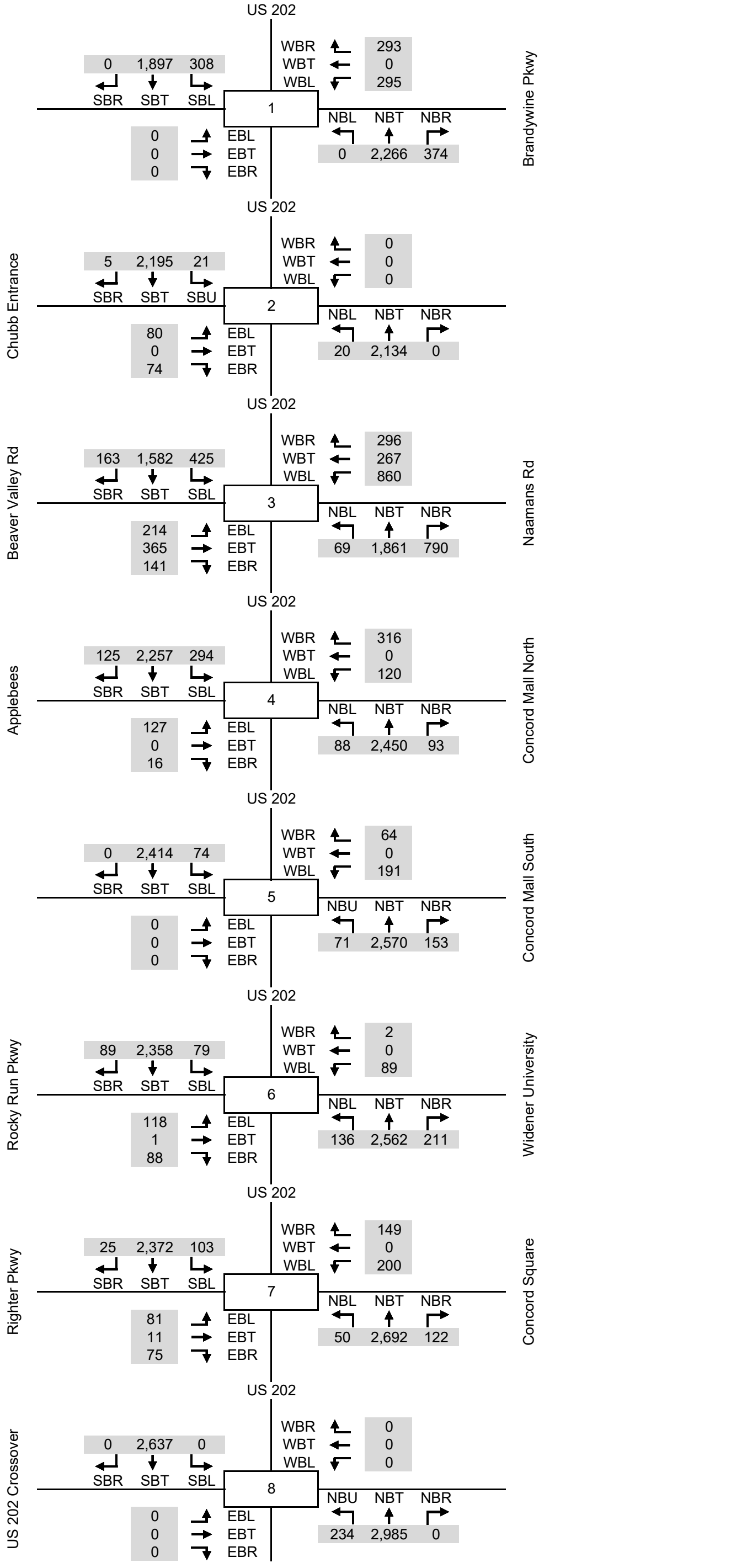

2050 By-right Development - PM Volumes

Additional Roadway and Ped/Bike Connections

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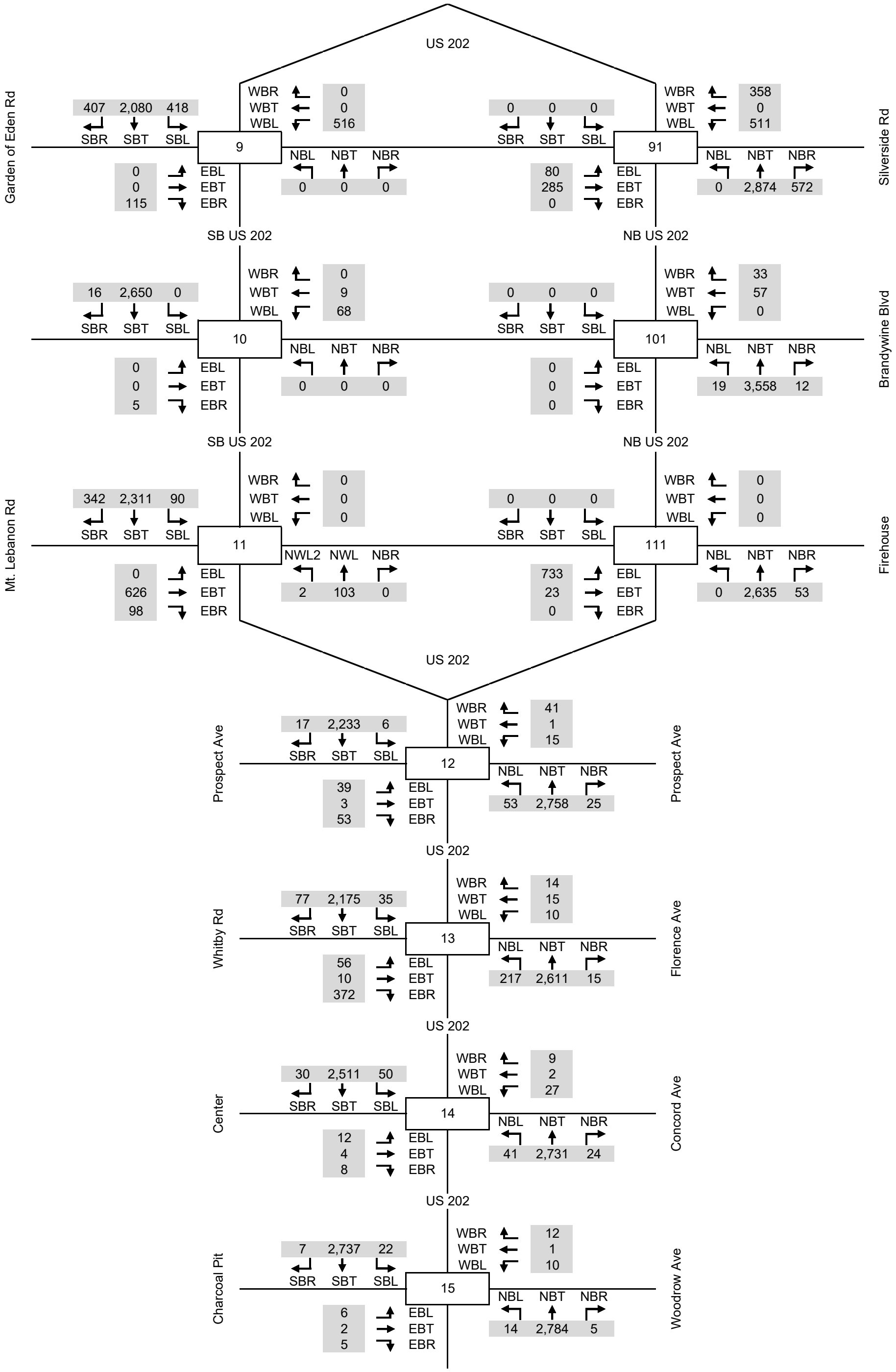

2050 By-right Development - PM Volumes

Additional Roadway and Ped/Bike Connections

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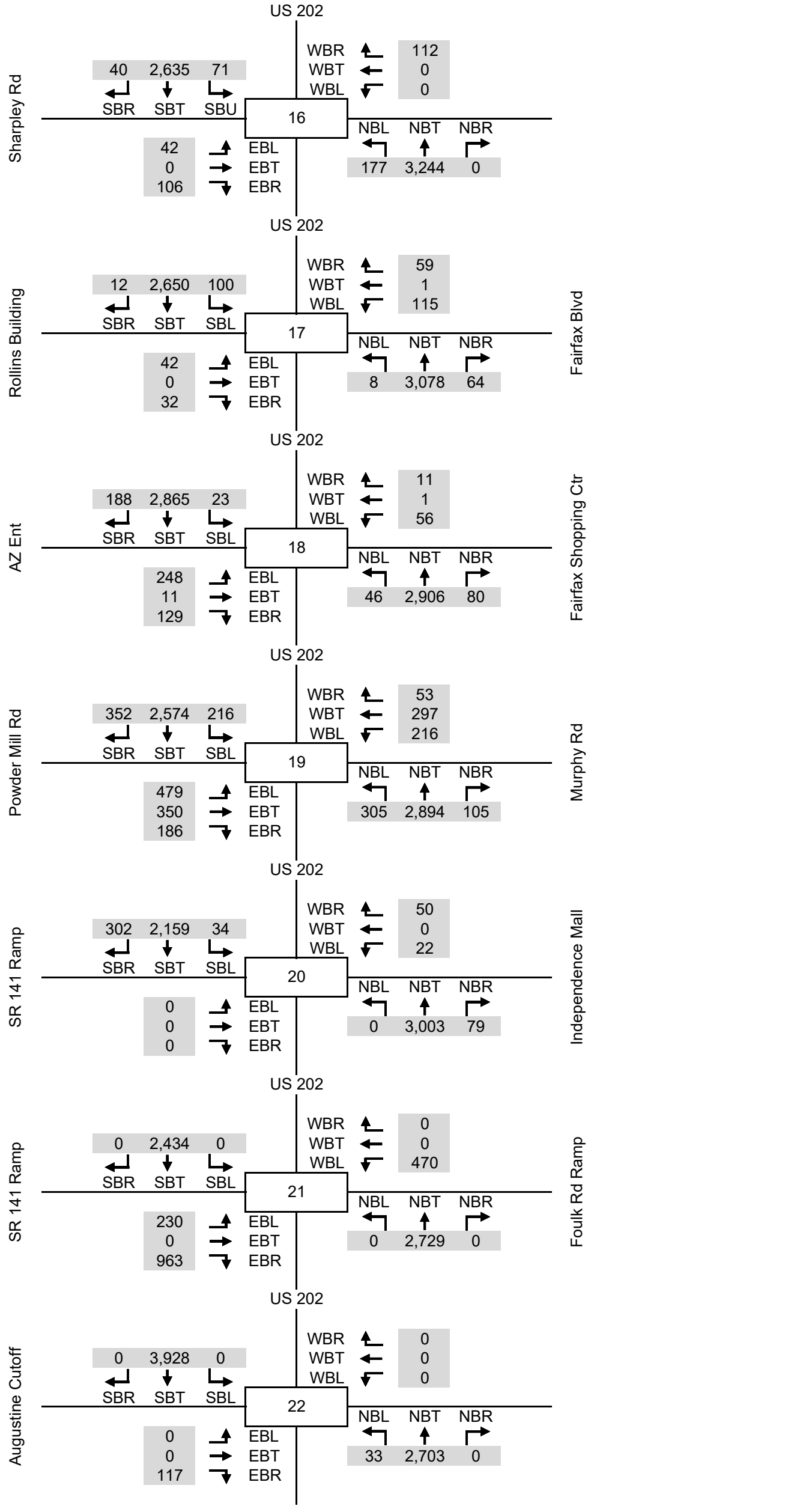
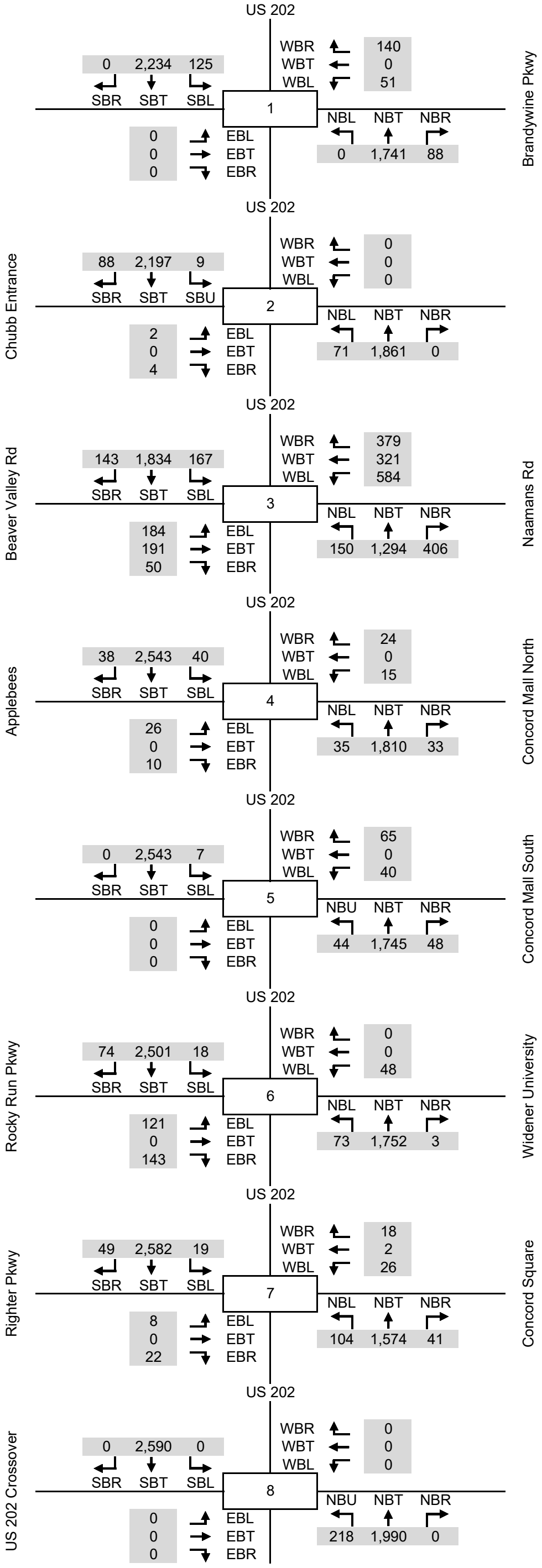


2050 Proposed Zoning Low - AM Volumes

Exiting Transportation Infrastructure

N



2050 Proposed Zoning Low - AM Volumes

Exiting Transportation Infrastructure

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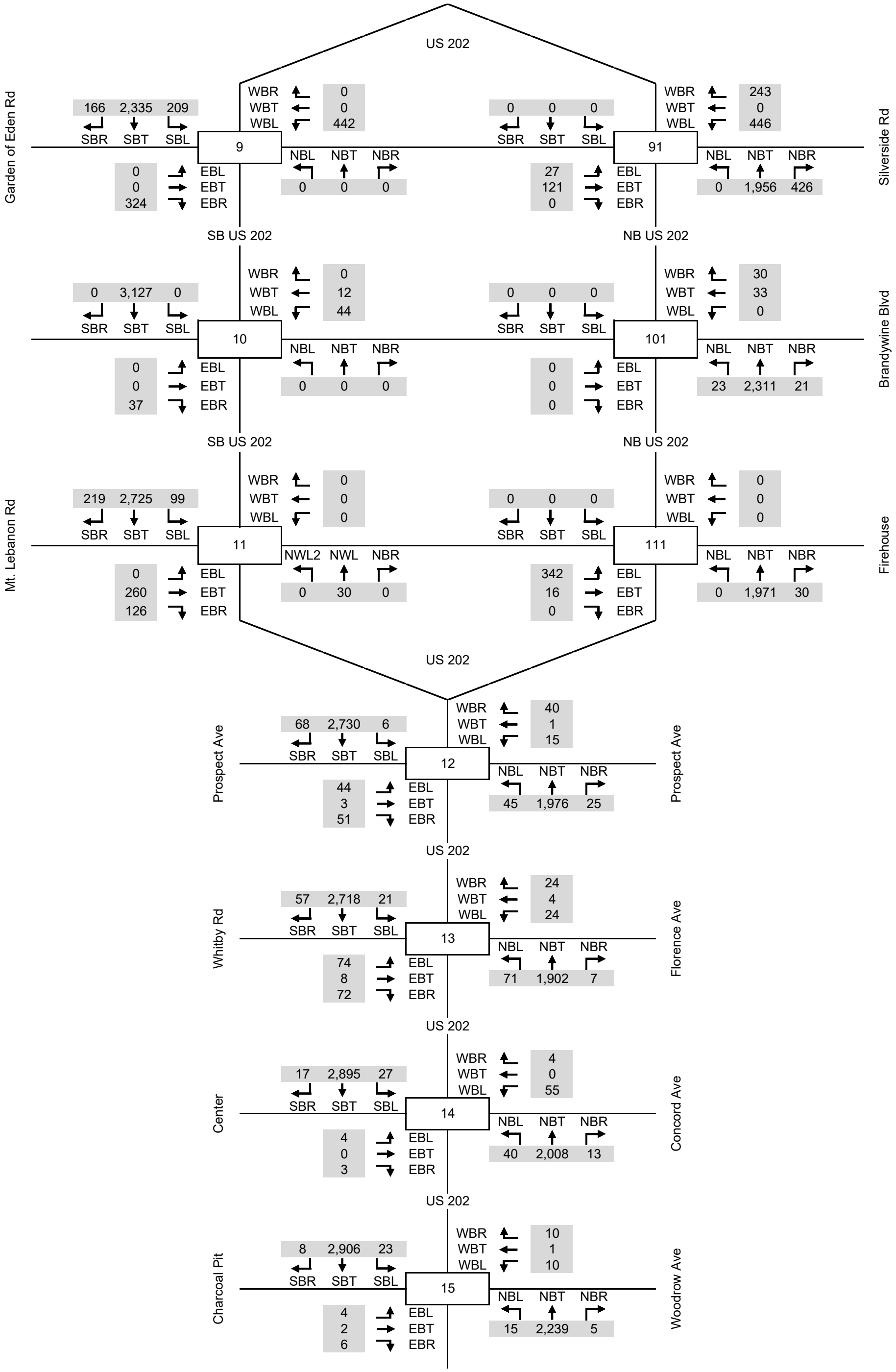

2050 Proposed Zoning Low - AM Volumes

Exiting Transportation Infrastructure

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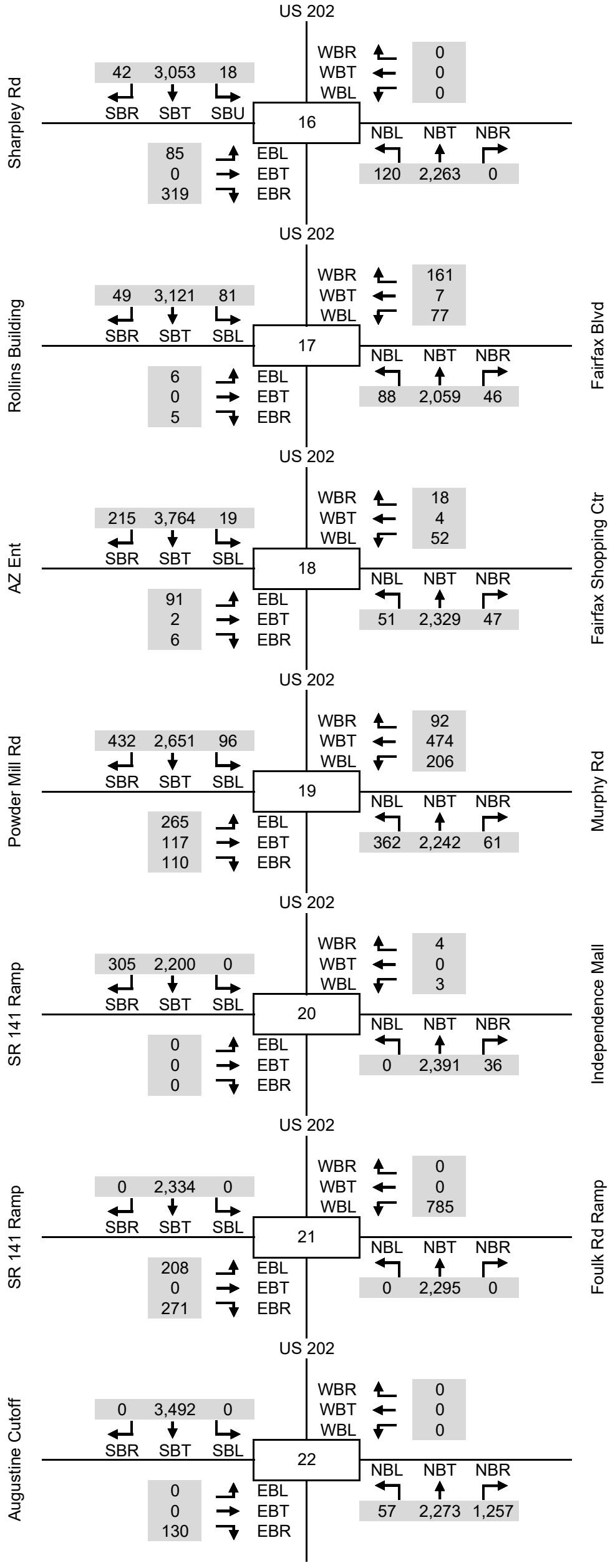

2050 Proposed Zoning Low - PM Volumes

Exiting Transportation Infrastructure

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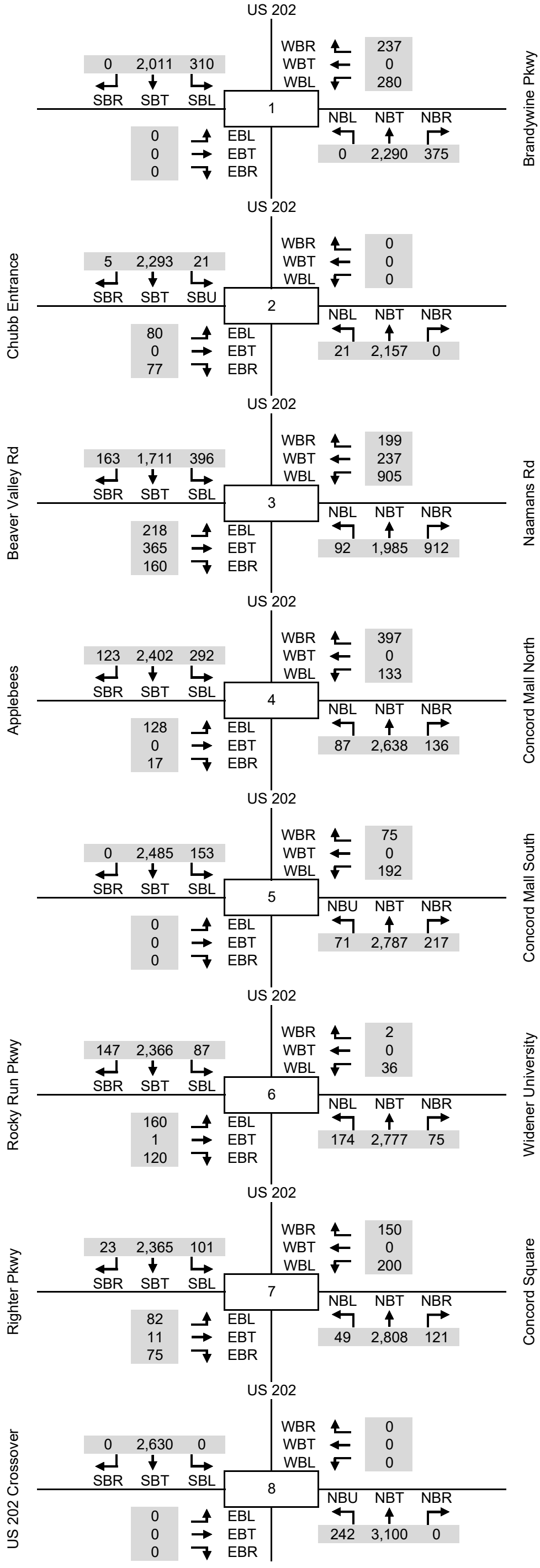

2050 Proposed Zoning Low - PM Volumes

Exiting Transportation Infrastructure

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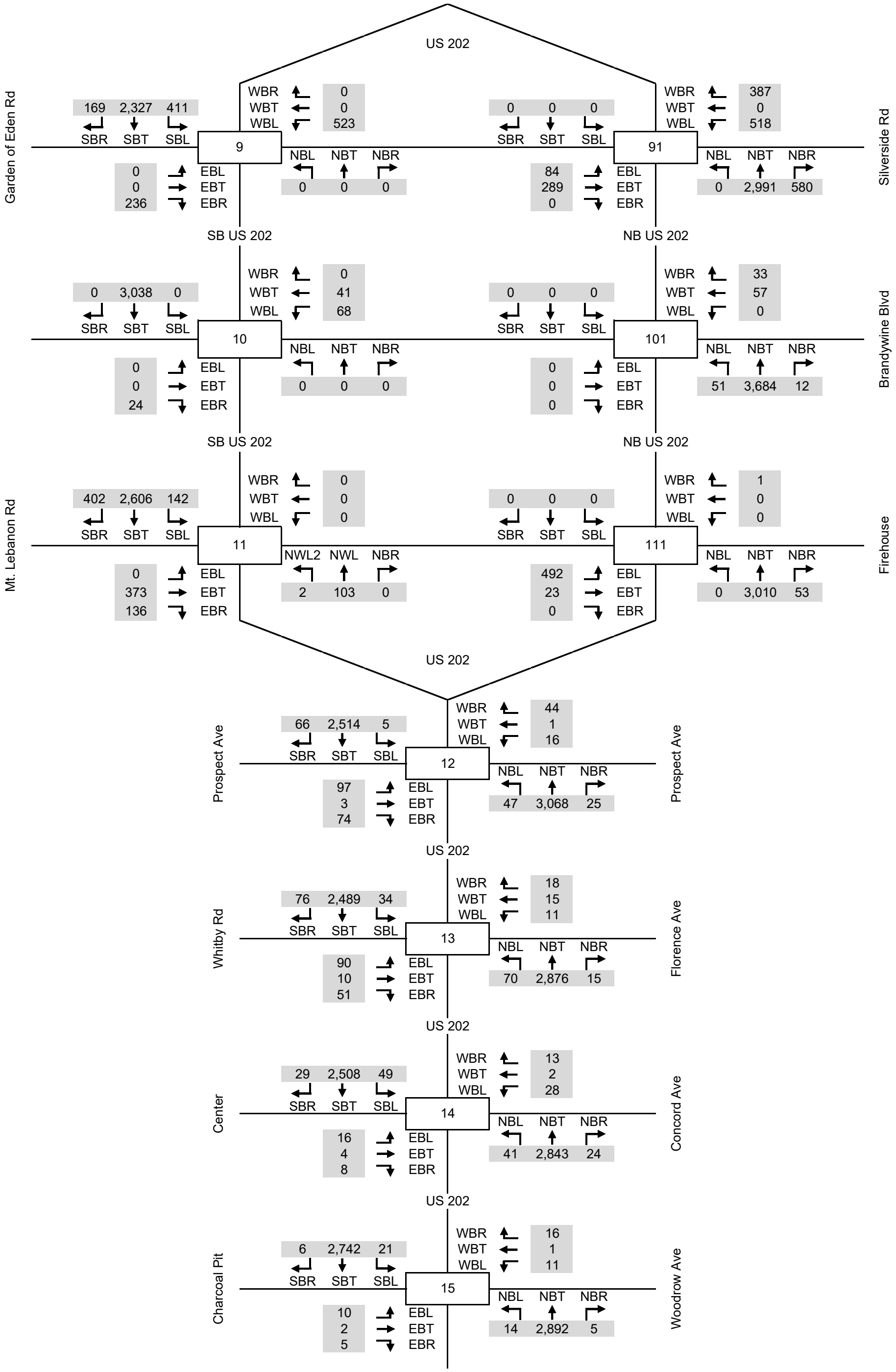

2050 Proposed Zoning Low - PM Volumes

Exiting Transportation Infrastructure

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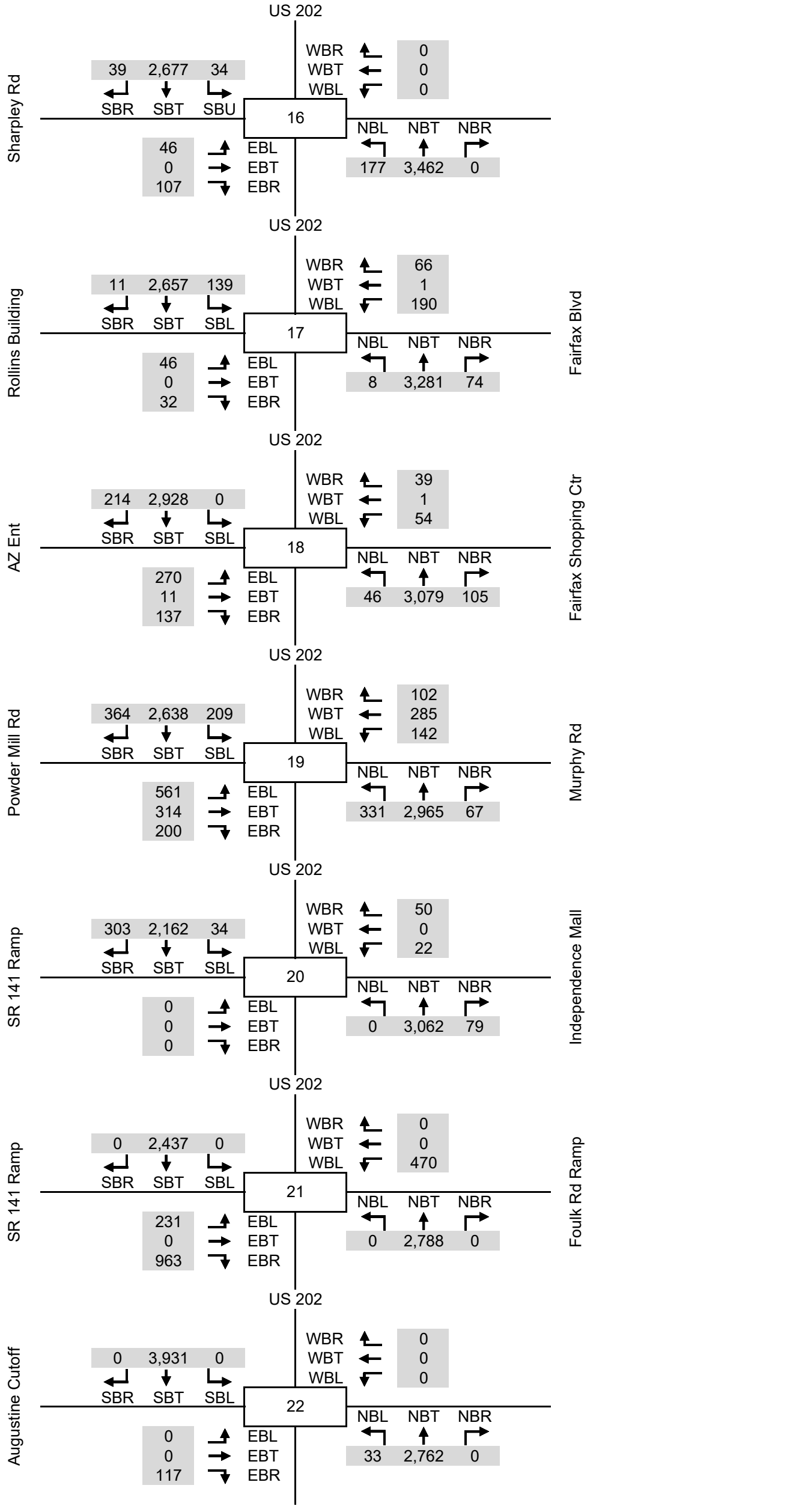

2050 Proposed Zoning Low - AM Volumes

Additional Roadway Connections

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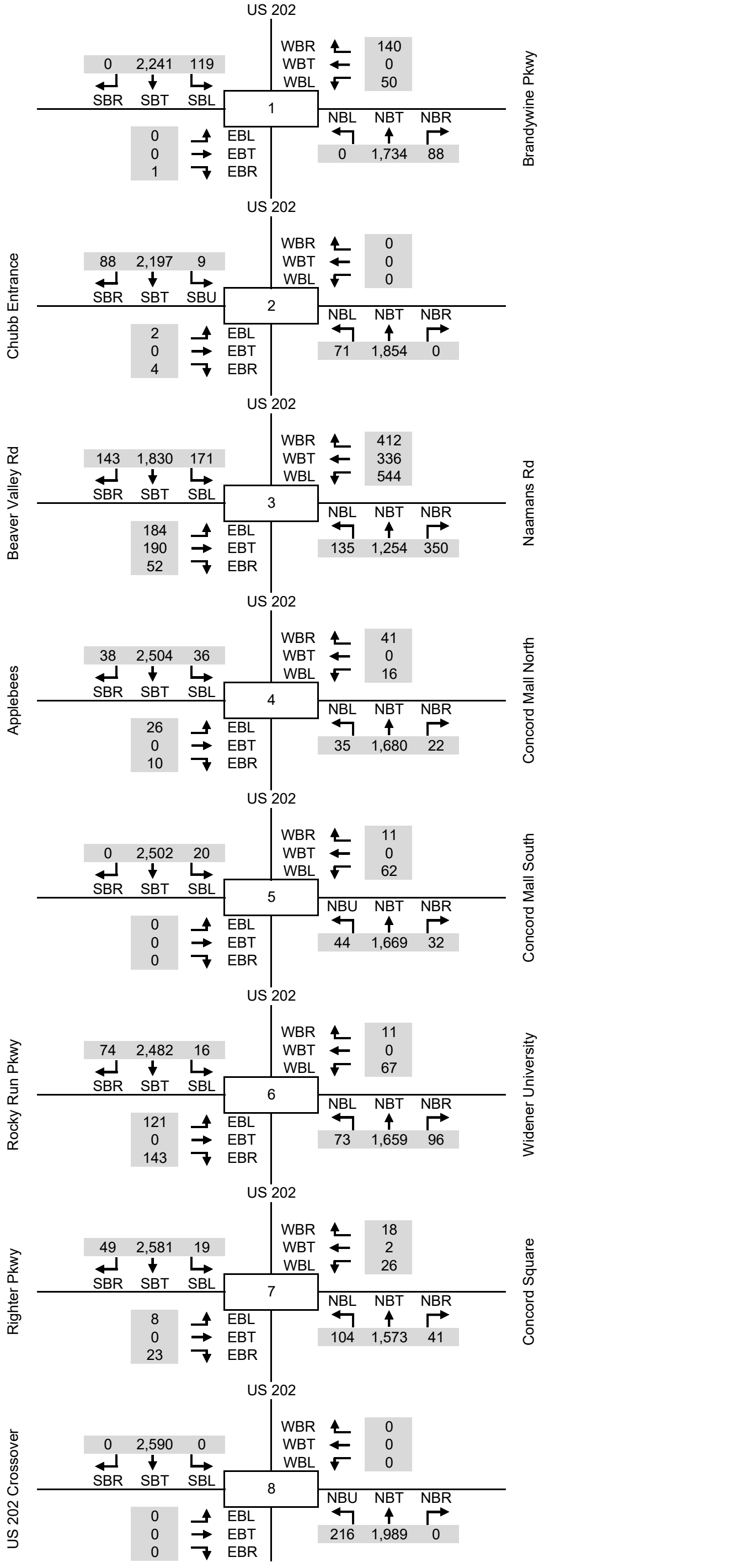

2050 Proposed Zoning Low - AM Volumes

Additional Roadway Connections

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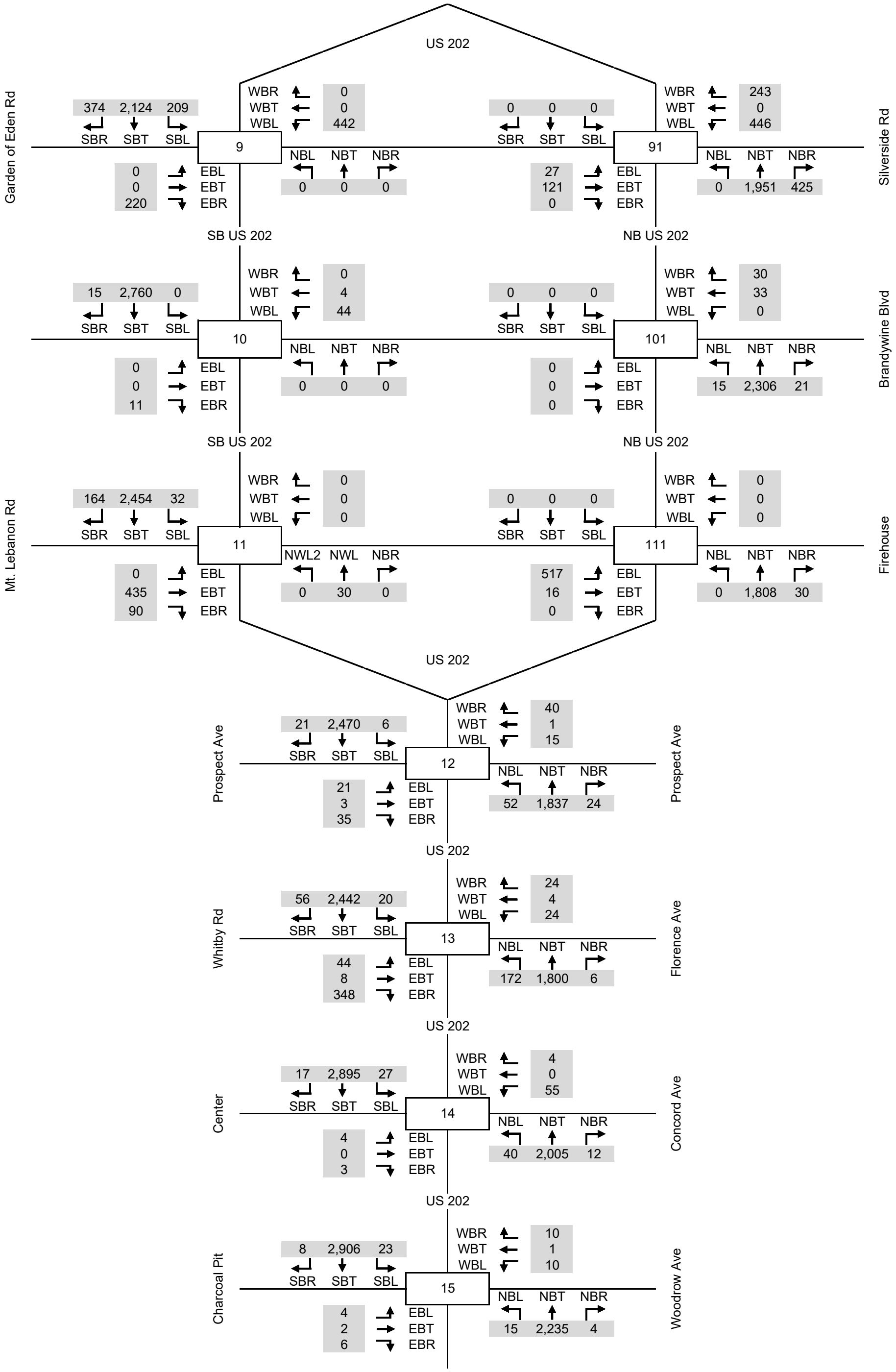

2050 Proposed Zoning Low - AM Volumes

Additional Roadway Connections

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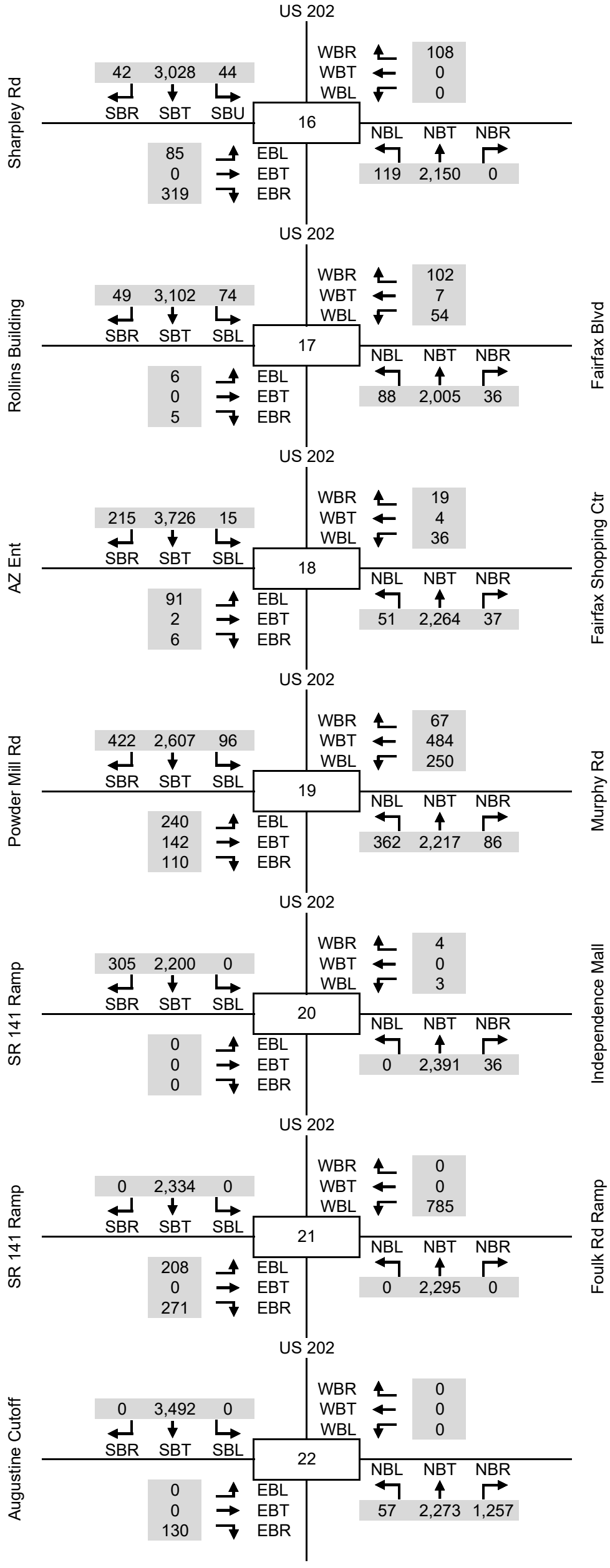

2050 Proposed Zoning Low - PM Volumes

Additional Roadway Connections

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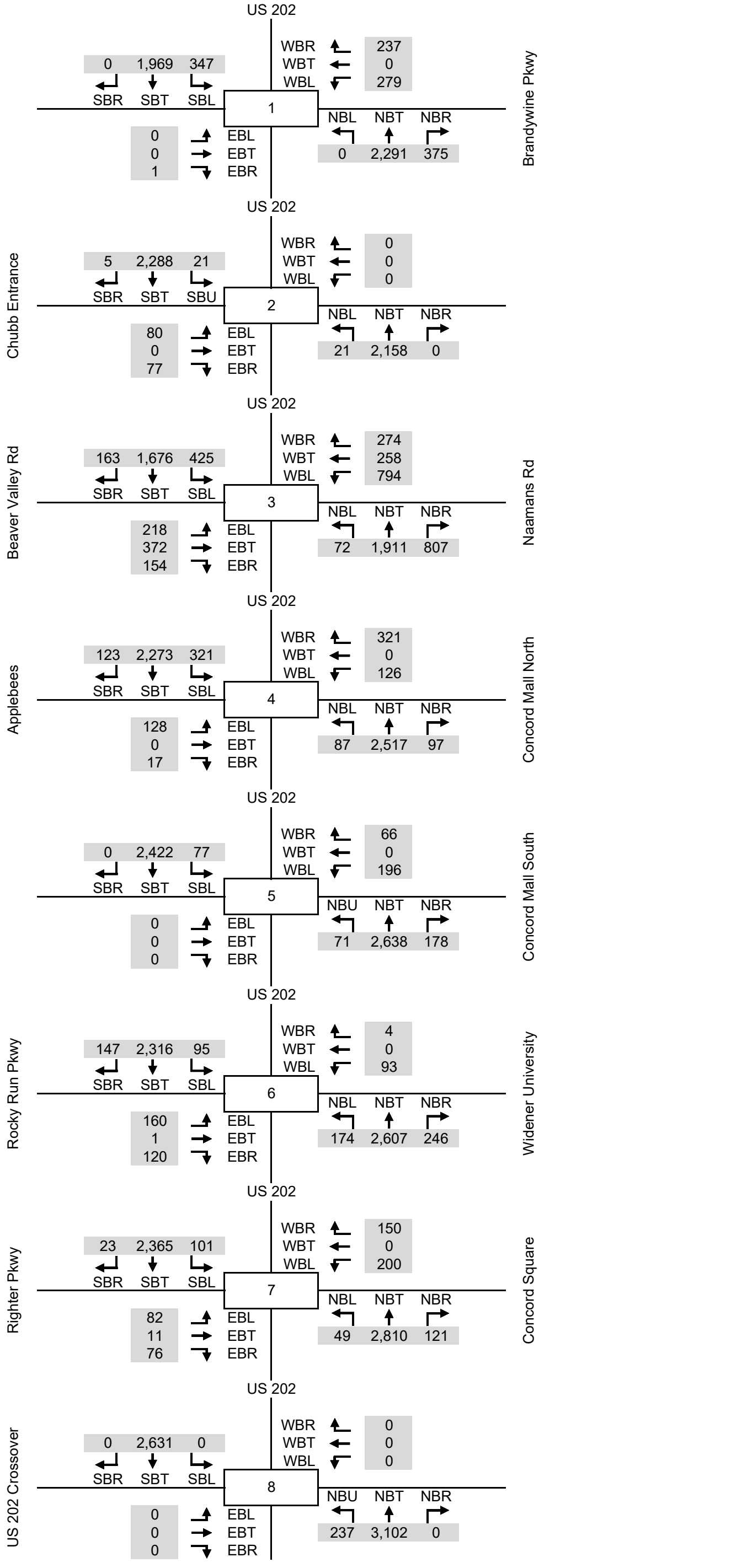

2050 Proposed Zoning Low - PM Volumes

Additional Roadway Connections

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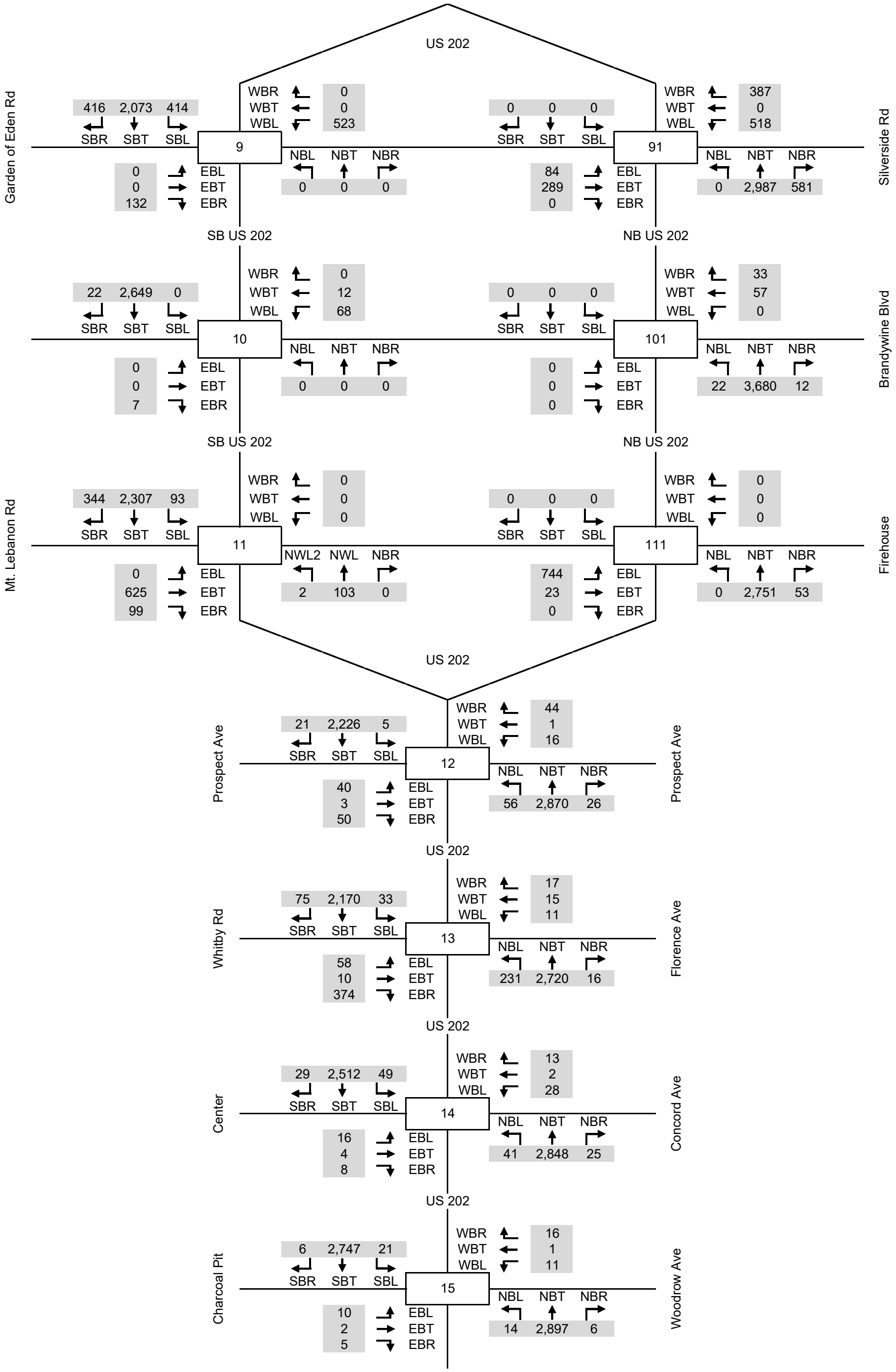

2050 Proposed Zoning Low - PM Volumes

Additional Roadway Connections

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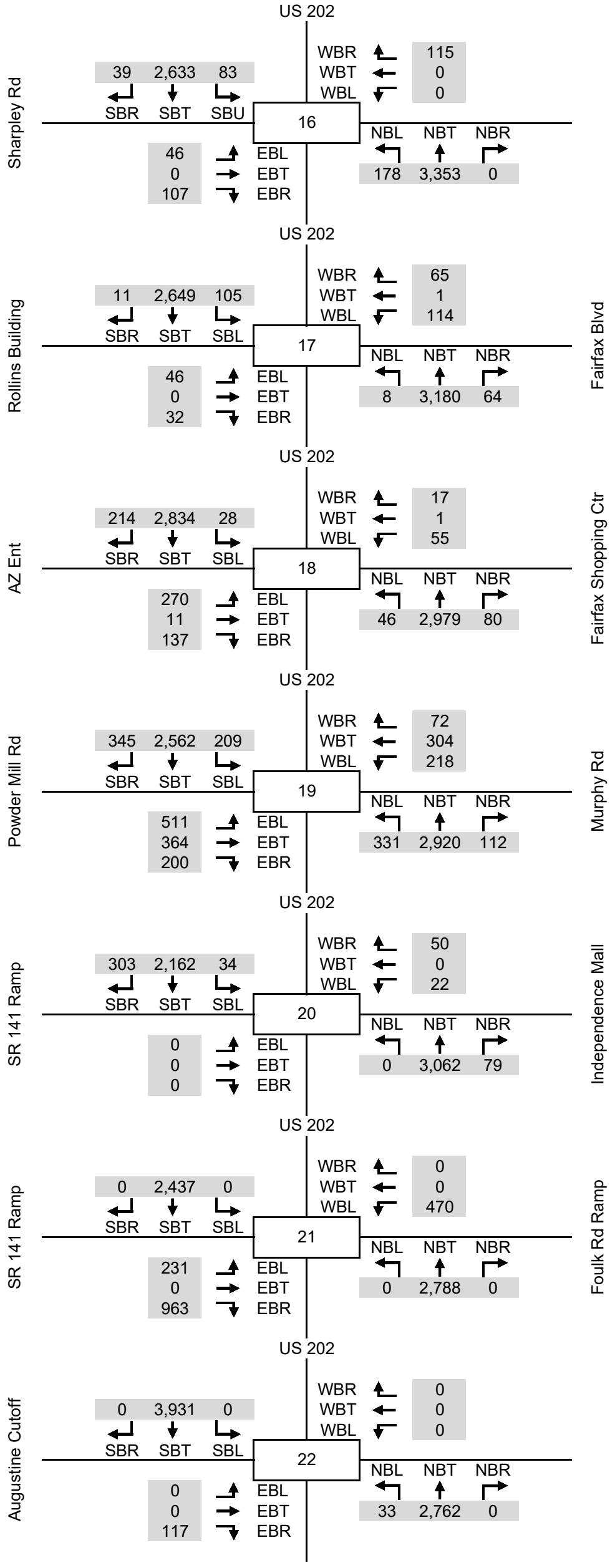

2050 Proposed Zoning Low - AM Volumes

Additional Roadway and Ped/Bike Connections

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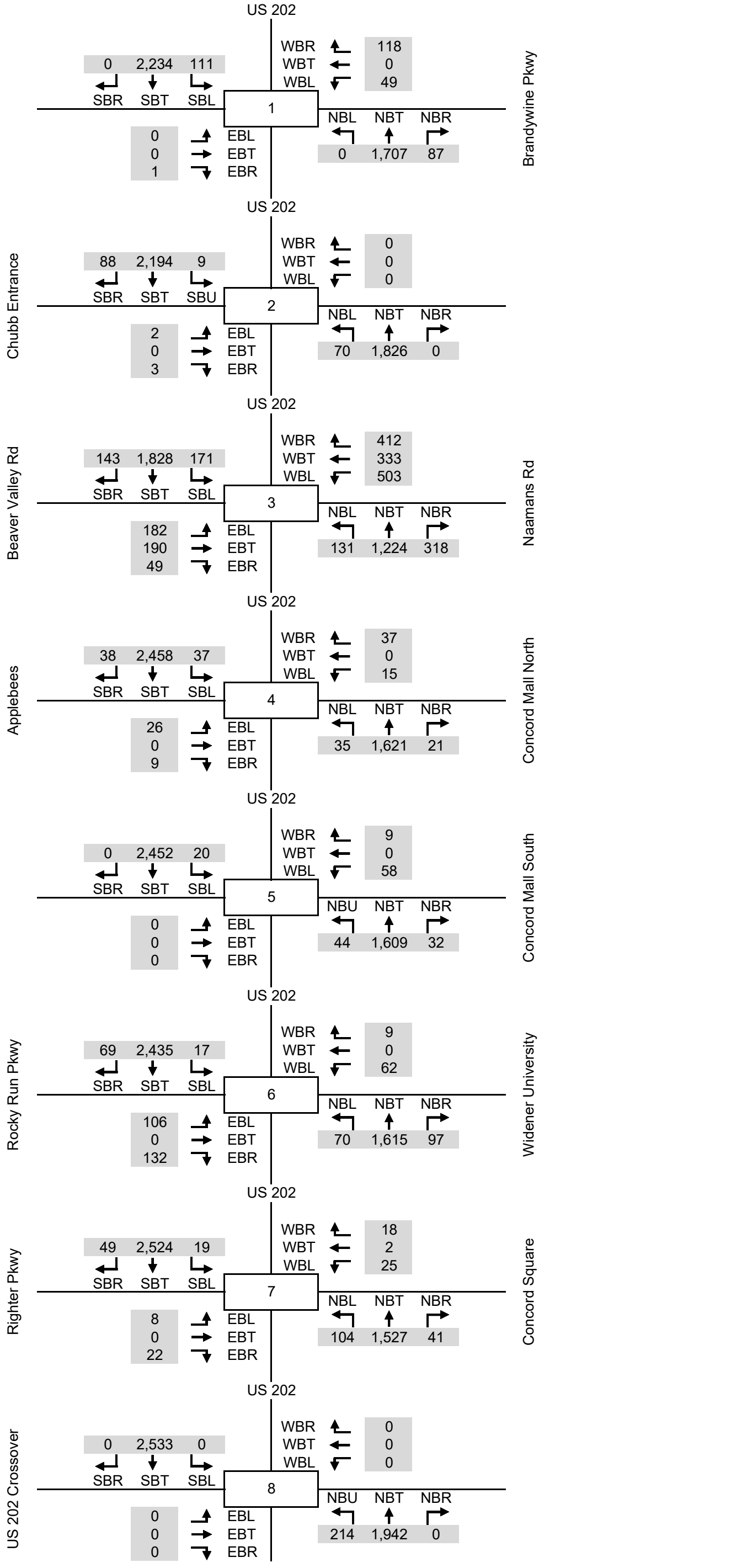

2050 Proposed Zoning Low - AM Volumes

Additional Roadway and Ped/Bike Connections

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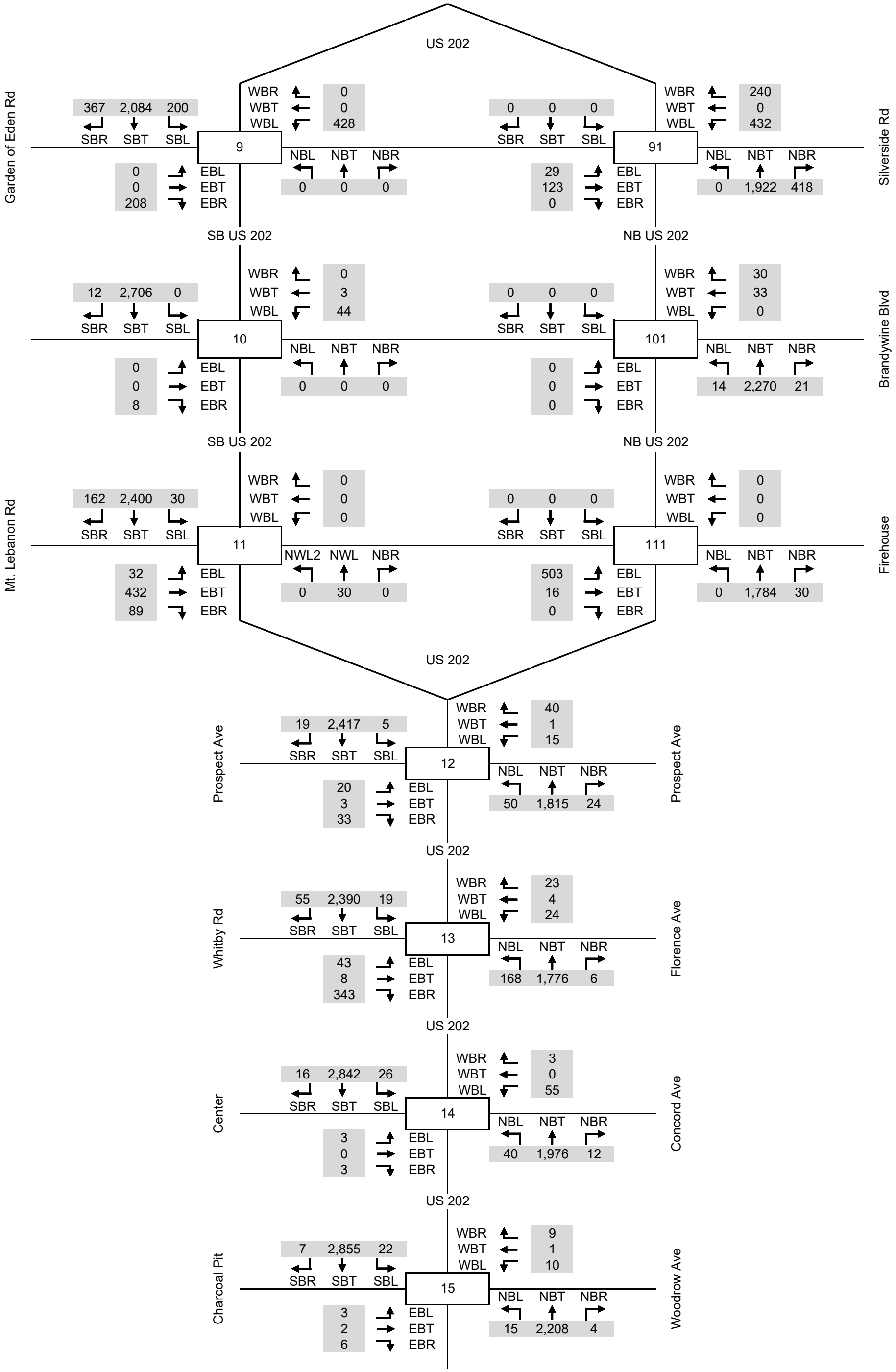

2050 Proposed Zoning Low - AM Volumes

Additional Roadway and Ped/Bike Connections

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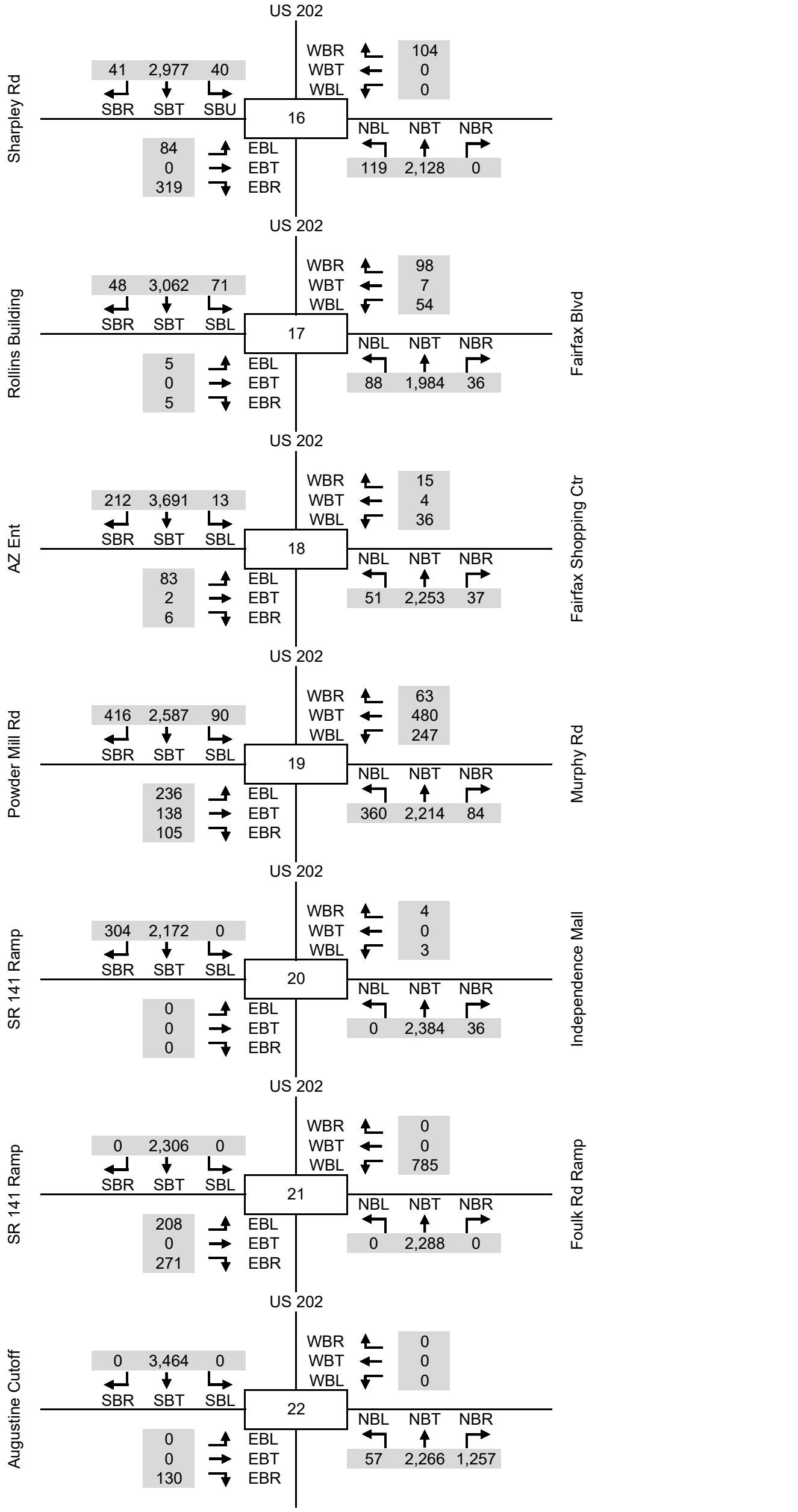

2050 Proposed Zoning Low - PM Volumes

Additional Roadway and Ped/Bike Connections

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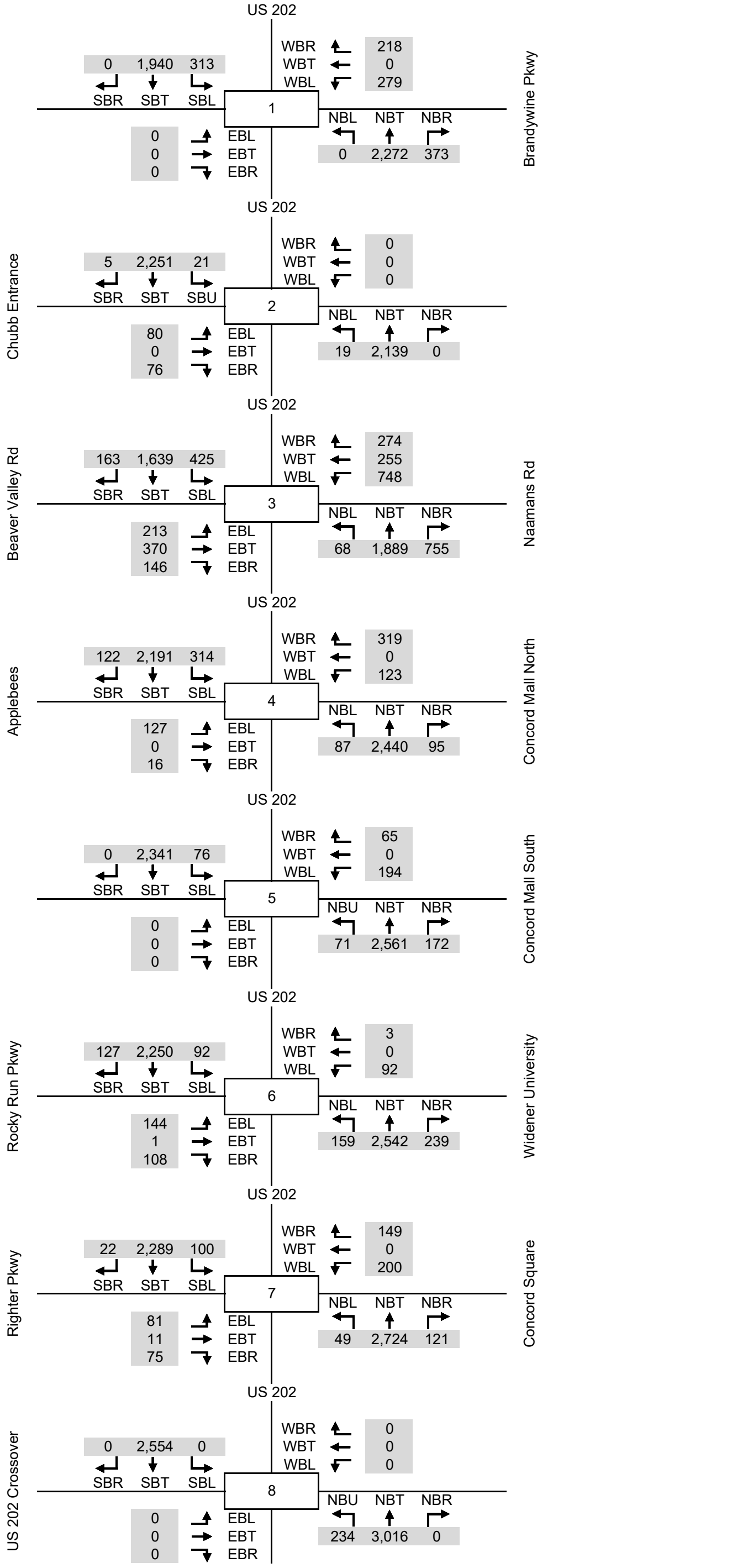

2050 Proposed Zoning Low - PM Volumes

Additional Roadway and Ped/Bike Connections

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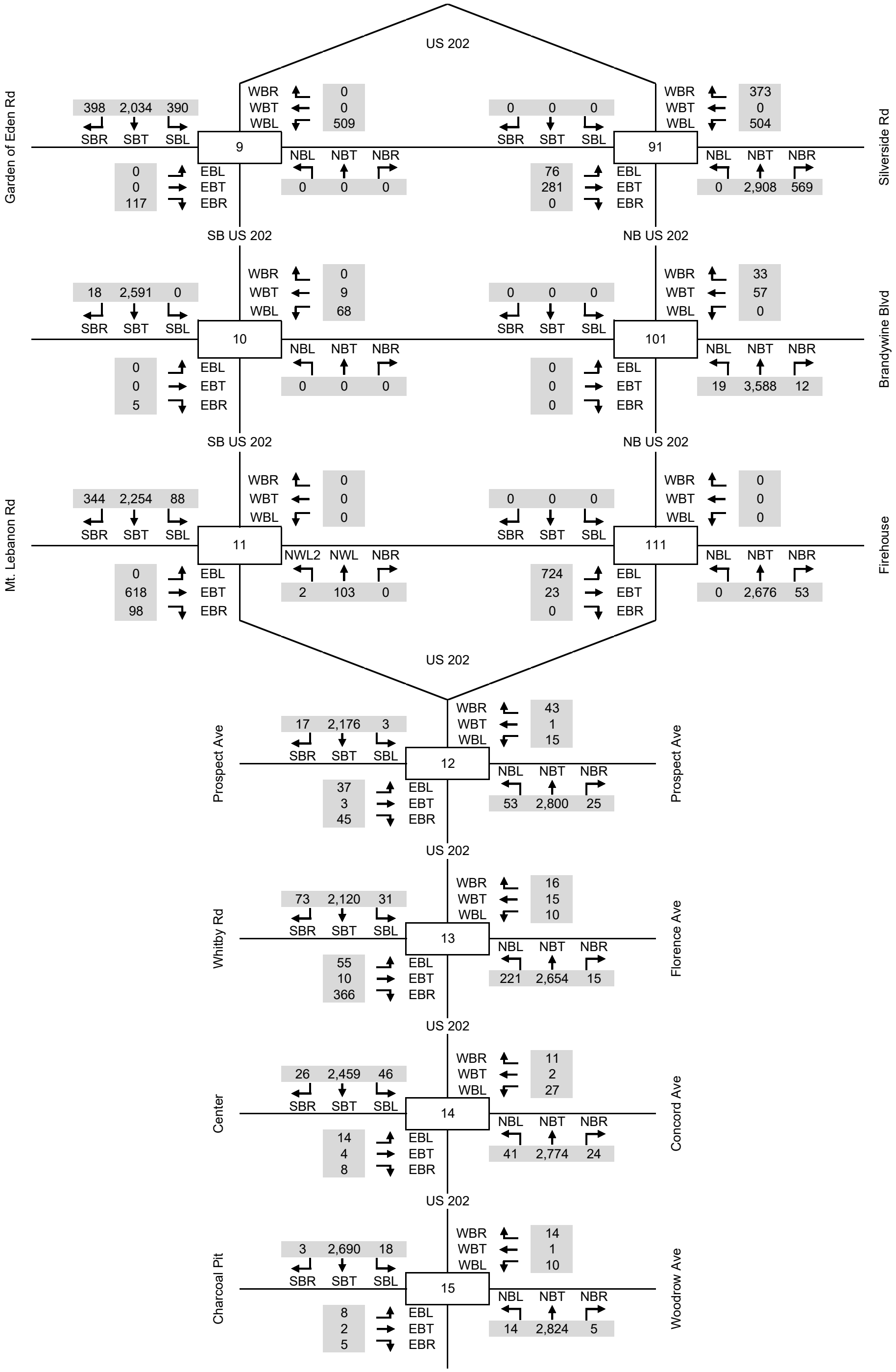
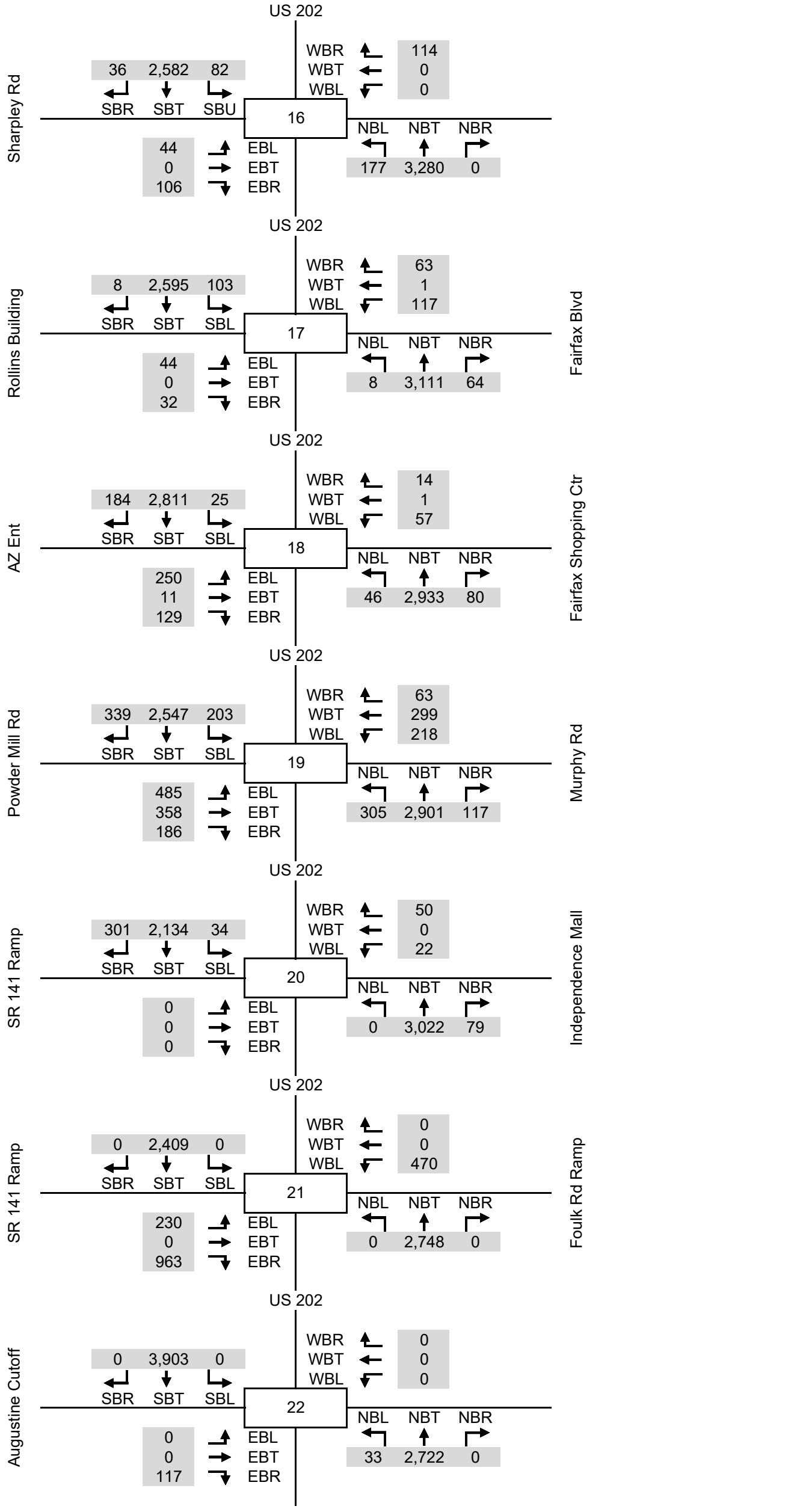


2050 Proposed Zoning Low - PM Volumes

Additional Roadway and Ped/Bike Connections

N



2050 Proposed Zoning Low - AM Volumes

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

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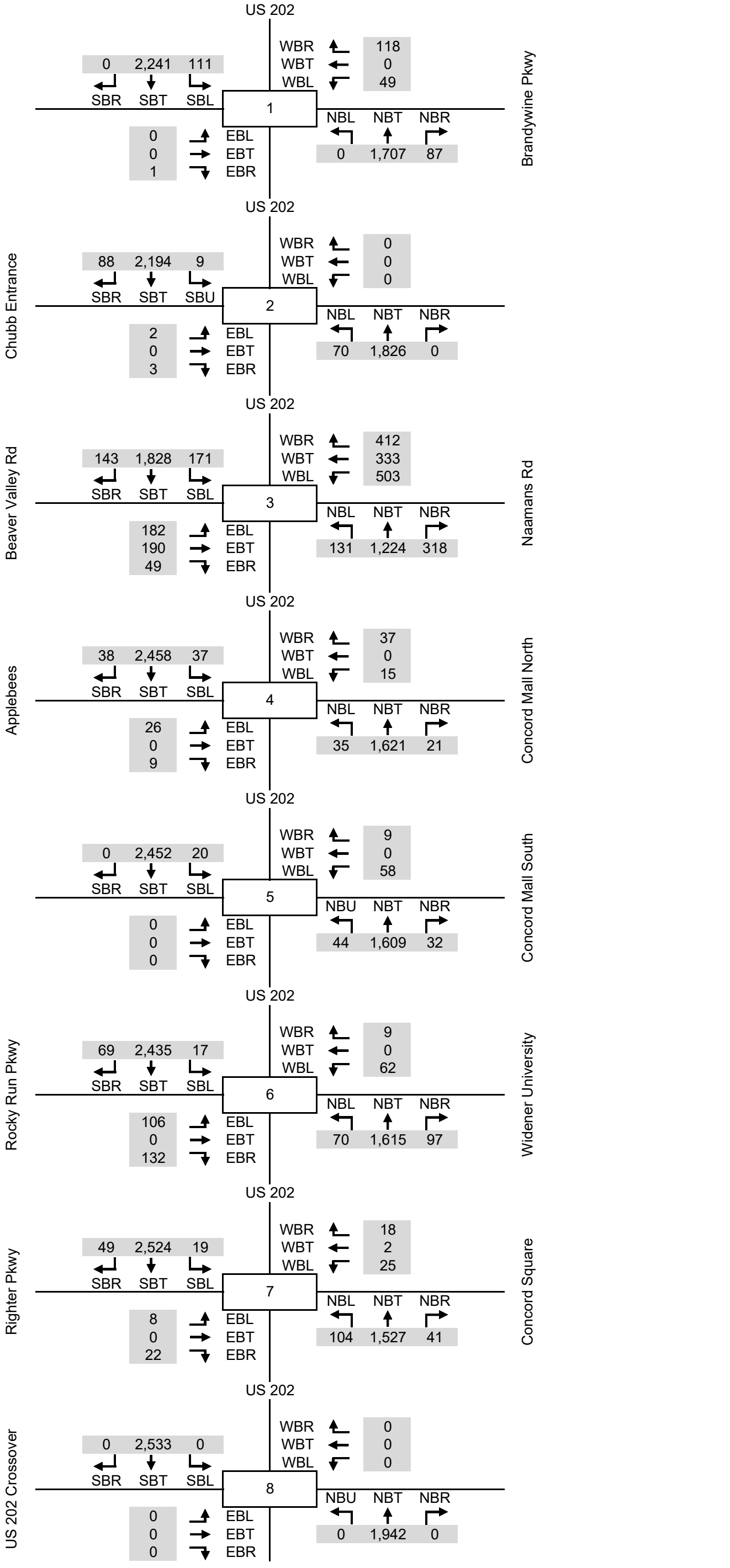

2050 Proposed Zoning Low - AM Volumes

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

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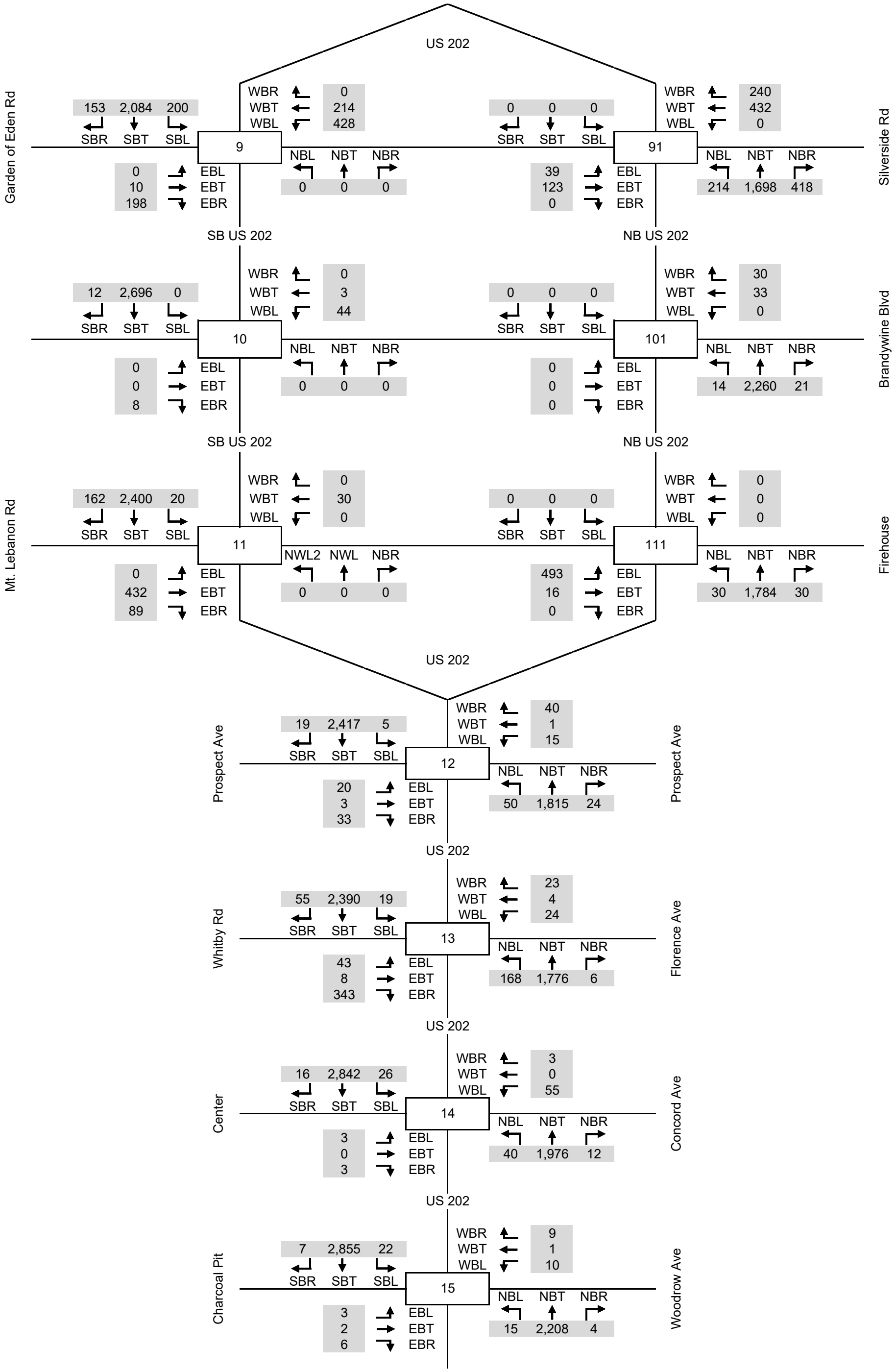

2050 Proposed Zoning Low - AM Volumes

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

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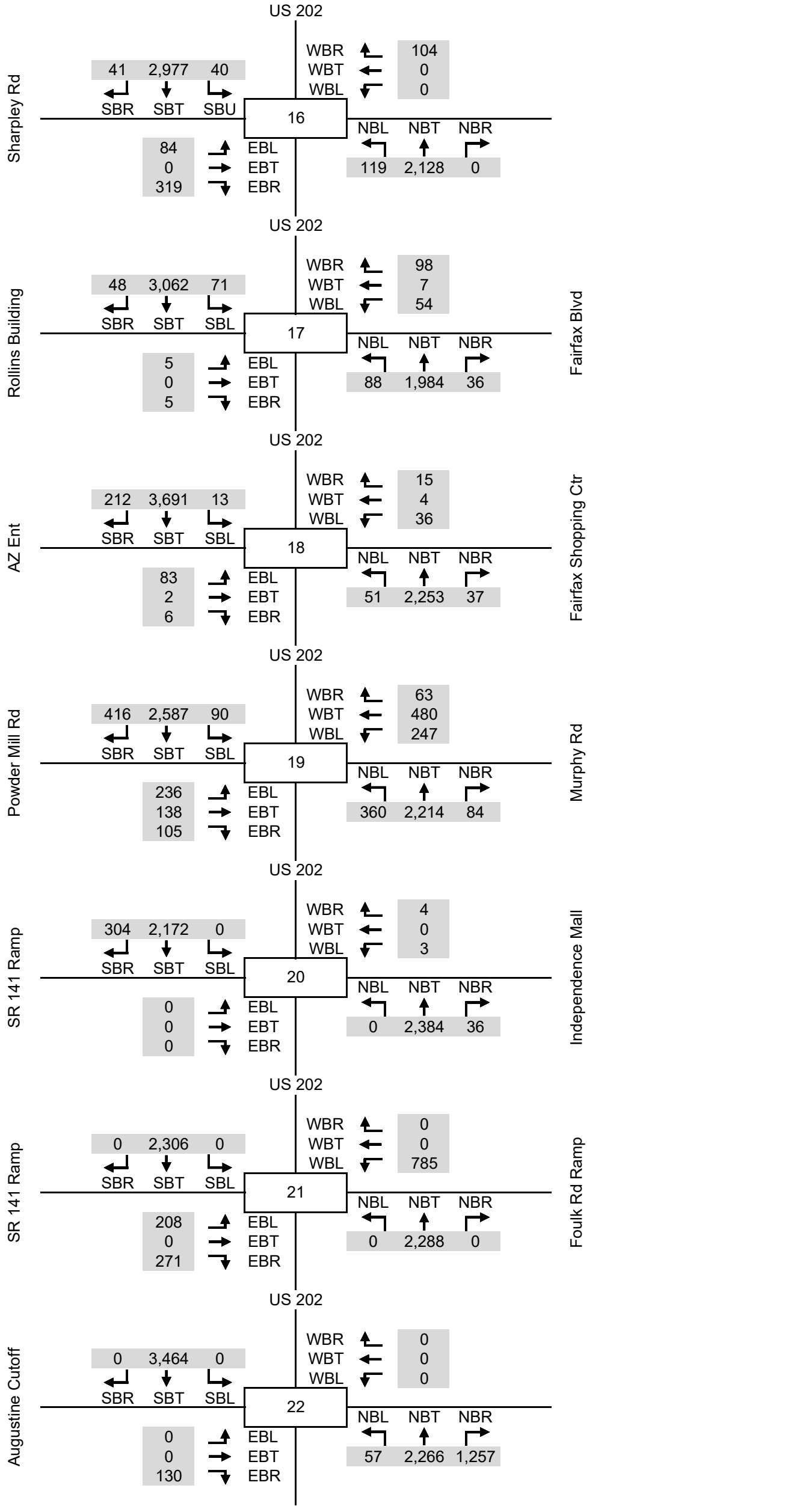

2050 Proposed Zoning Low - PM Volumes

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

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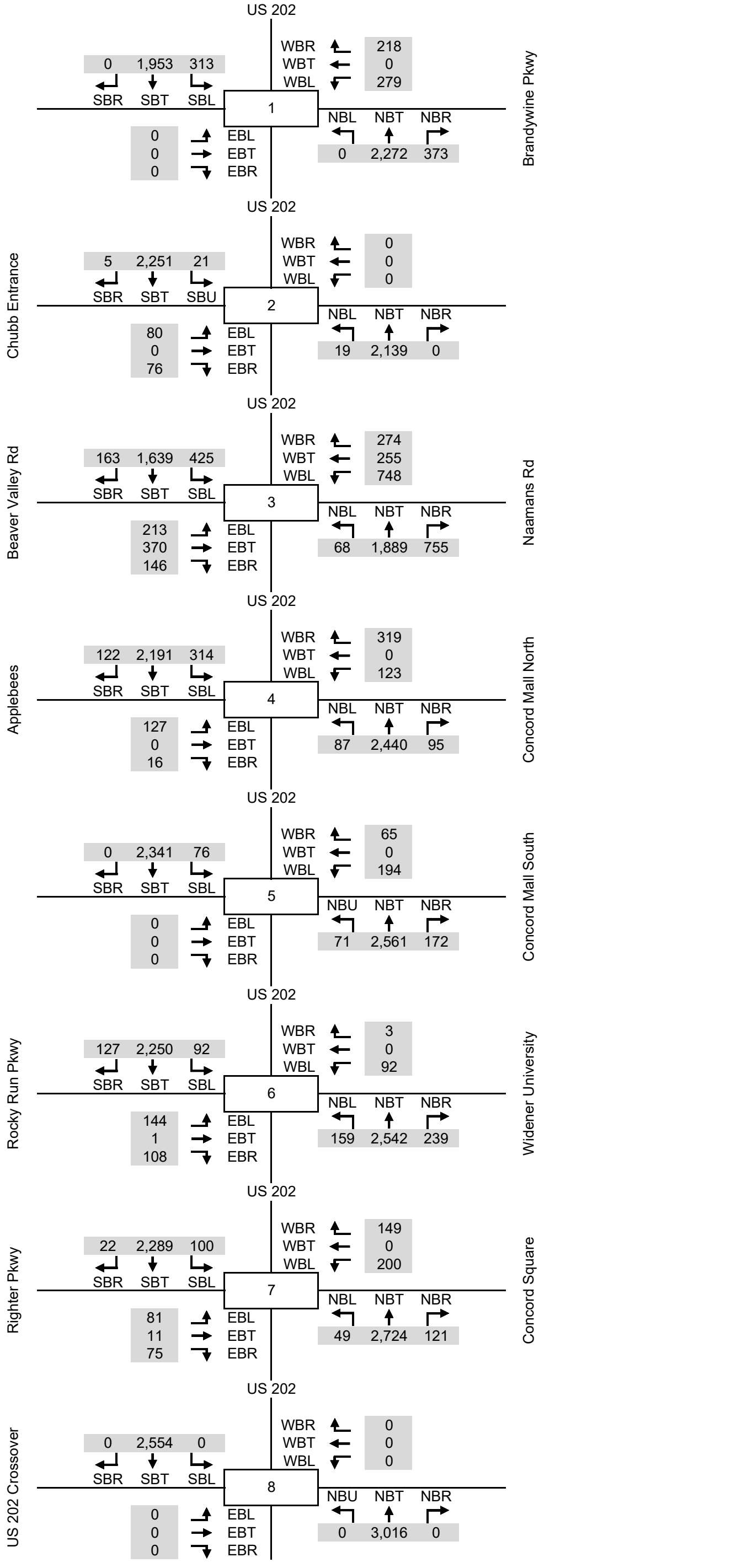

2050 Proposed Zoning Low - PM Volumes

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

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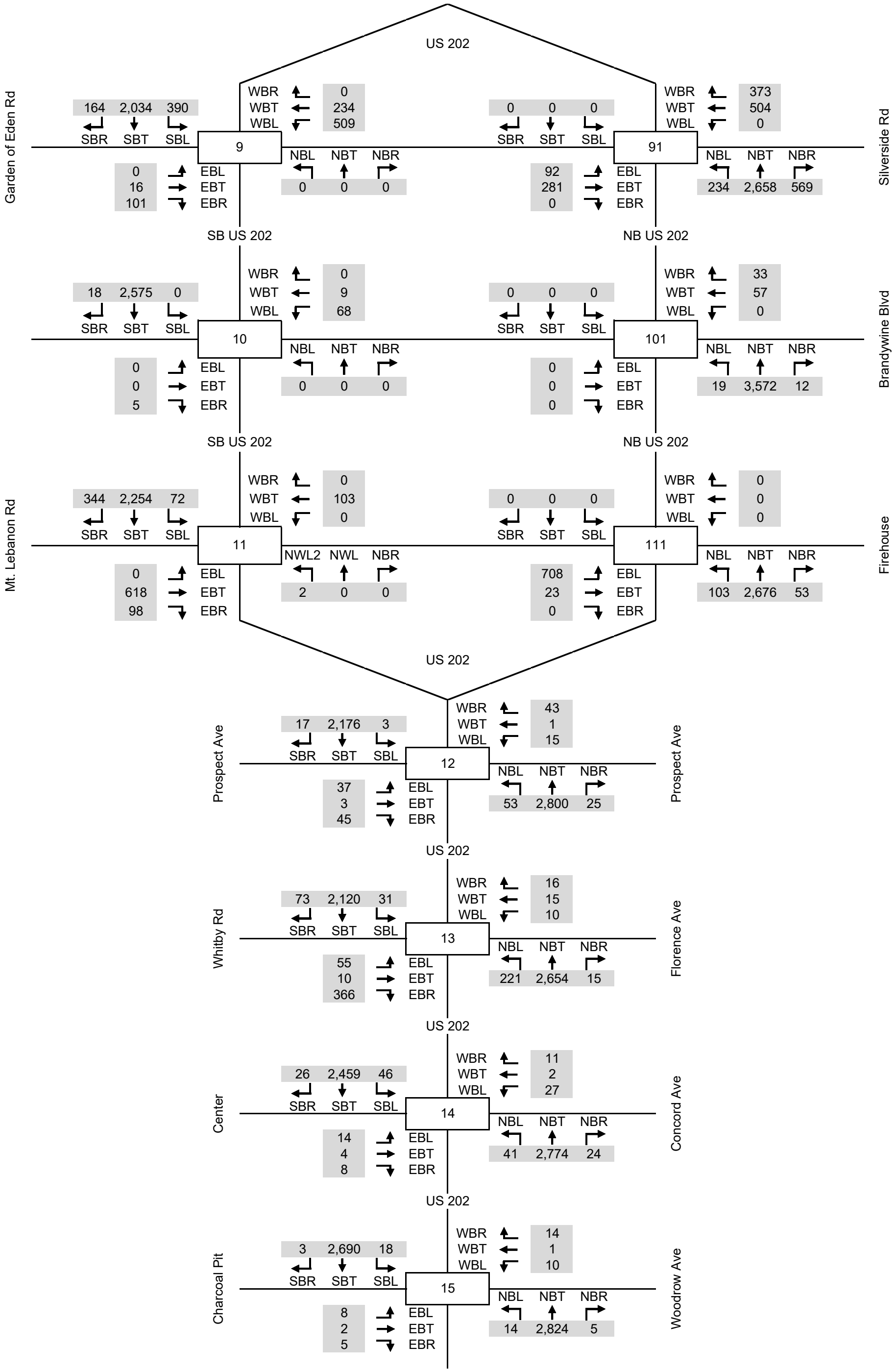

2050 Proposed Zoning Low - PM Volumes

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

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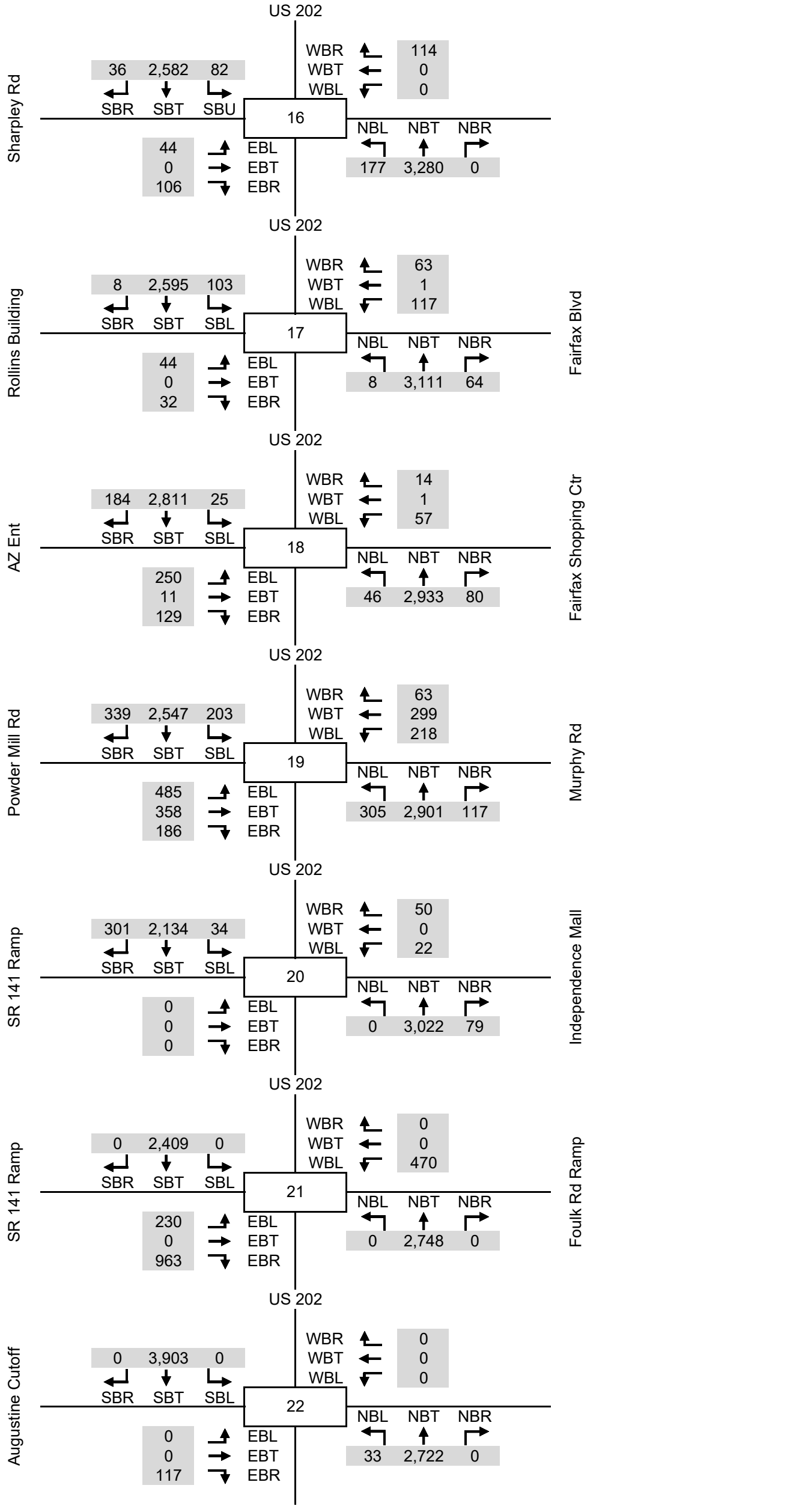
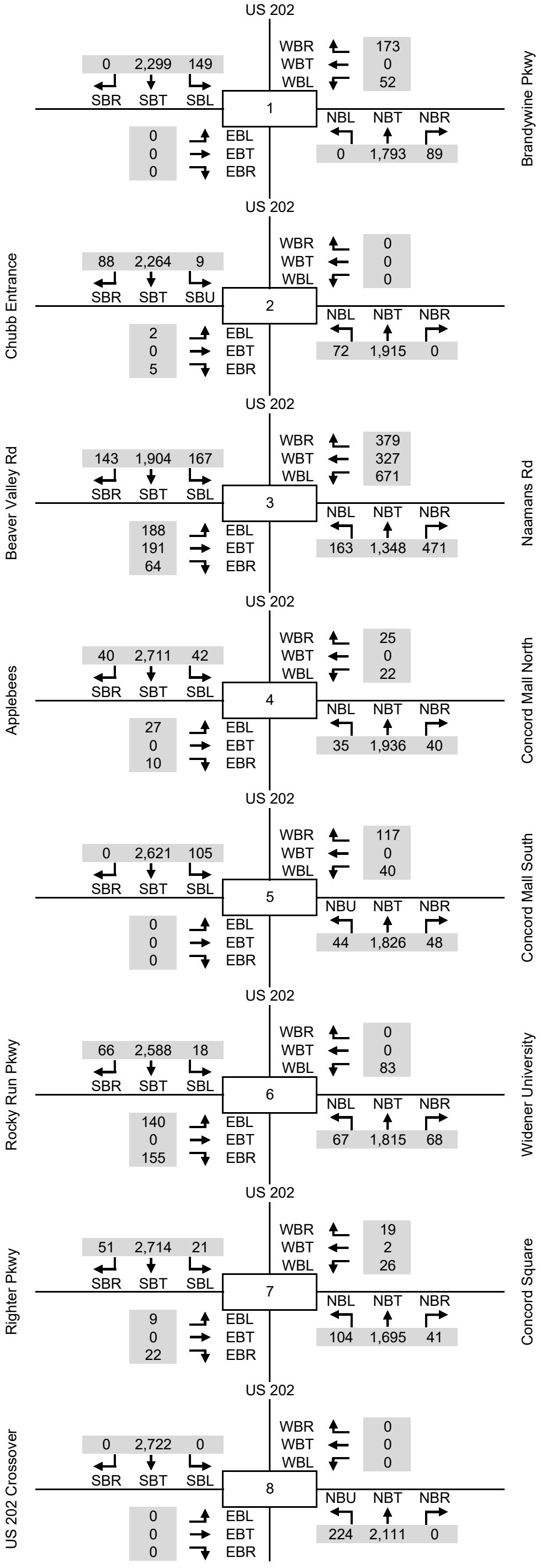


2050 Proposed Zoning High - AM Volumes

Exiting Transportation Infrastructure

N



2050 Proposed Zoning High - AM Volumes

Exiting Transportation Infrastructure

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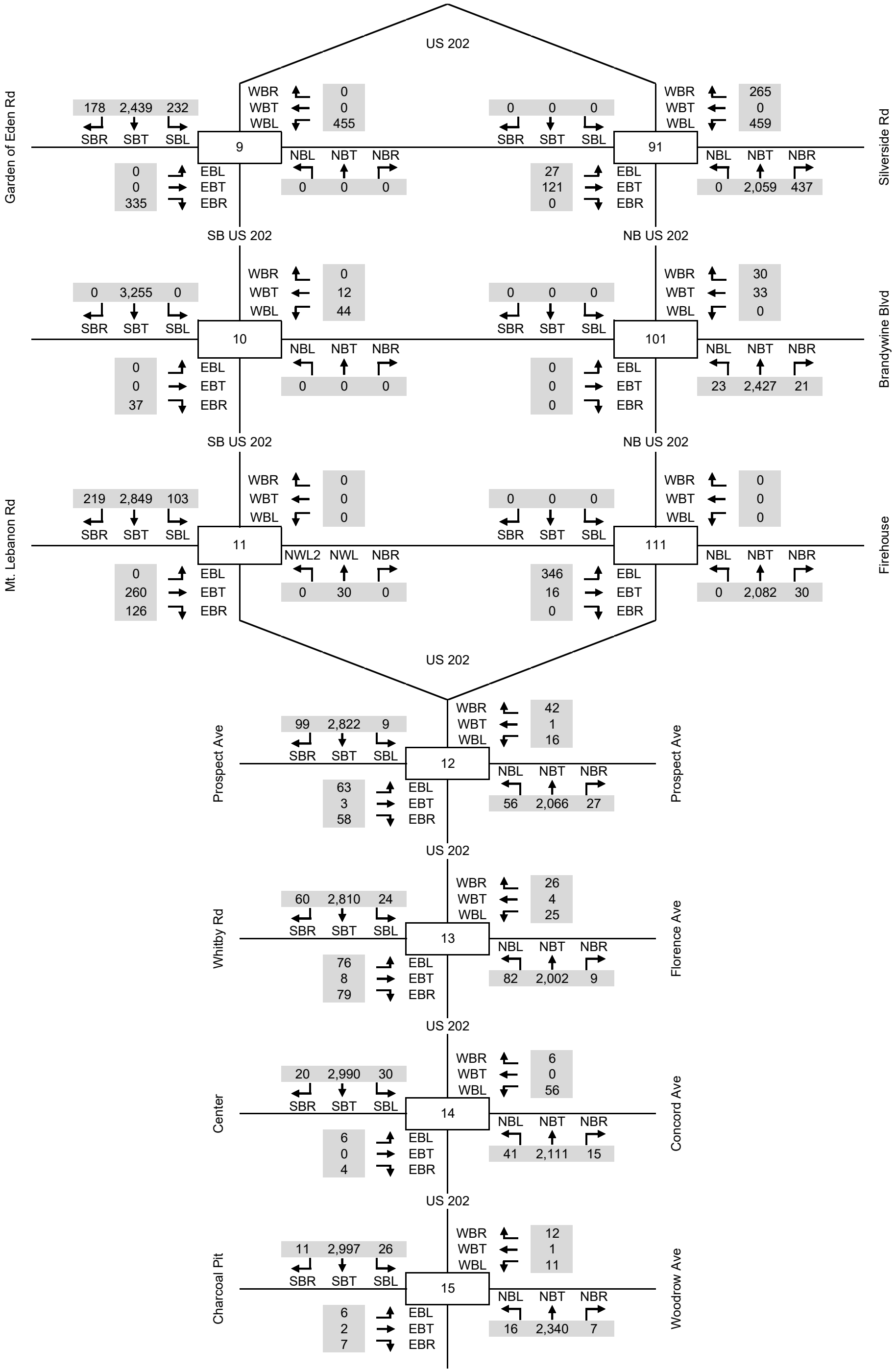

2050 Proposed Zoning High - AM Volumes

Exiting Transportation Infrastructure

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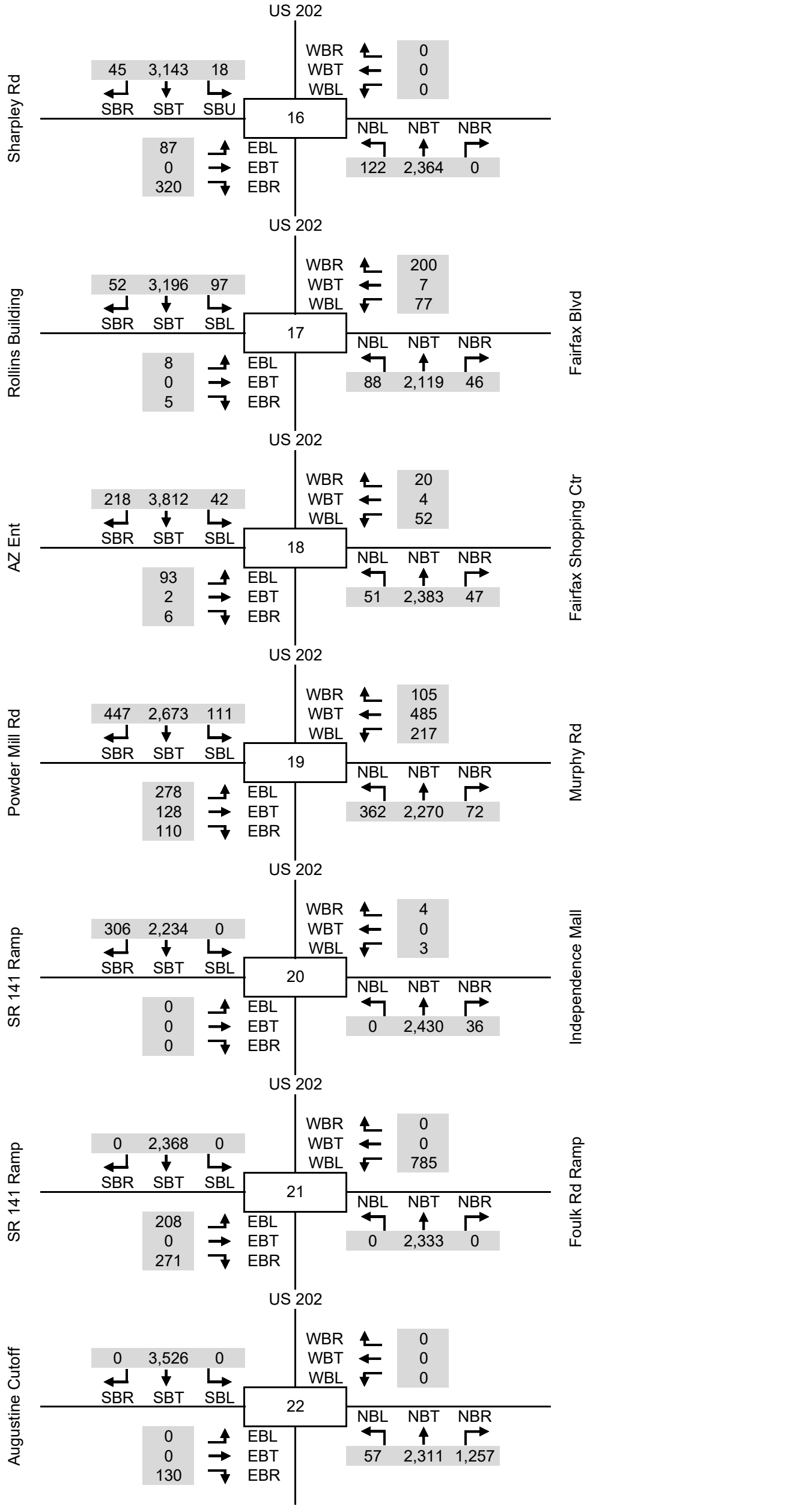

2050 Proposed Zoning High - PM Volumes

Exiting Transportation Infrastructure

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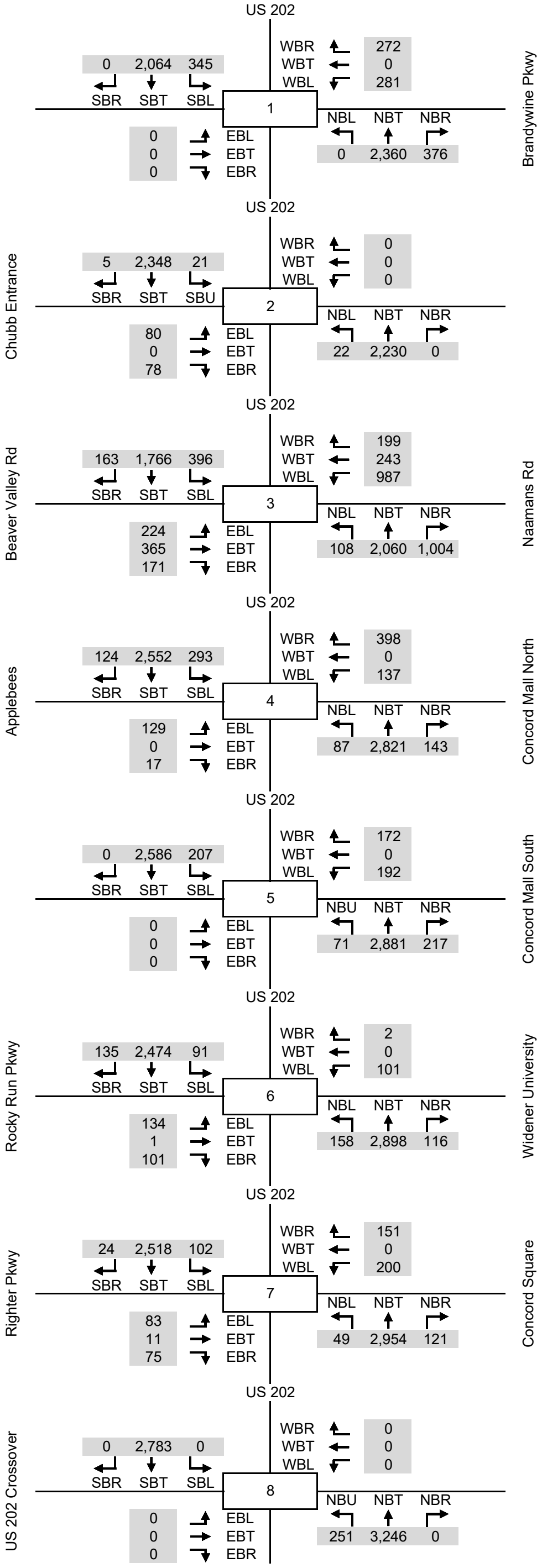

2050 Proposed Zoning High - PM Volumes

Exiting Transportation Infrastructure

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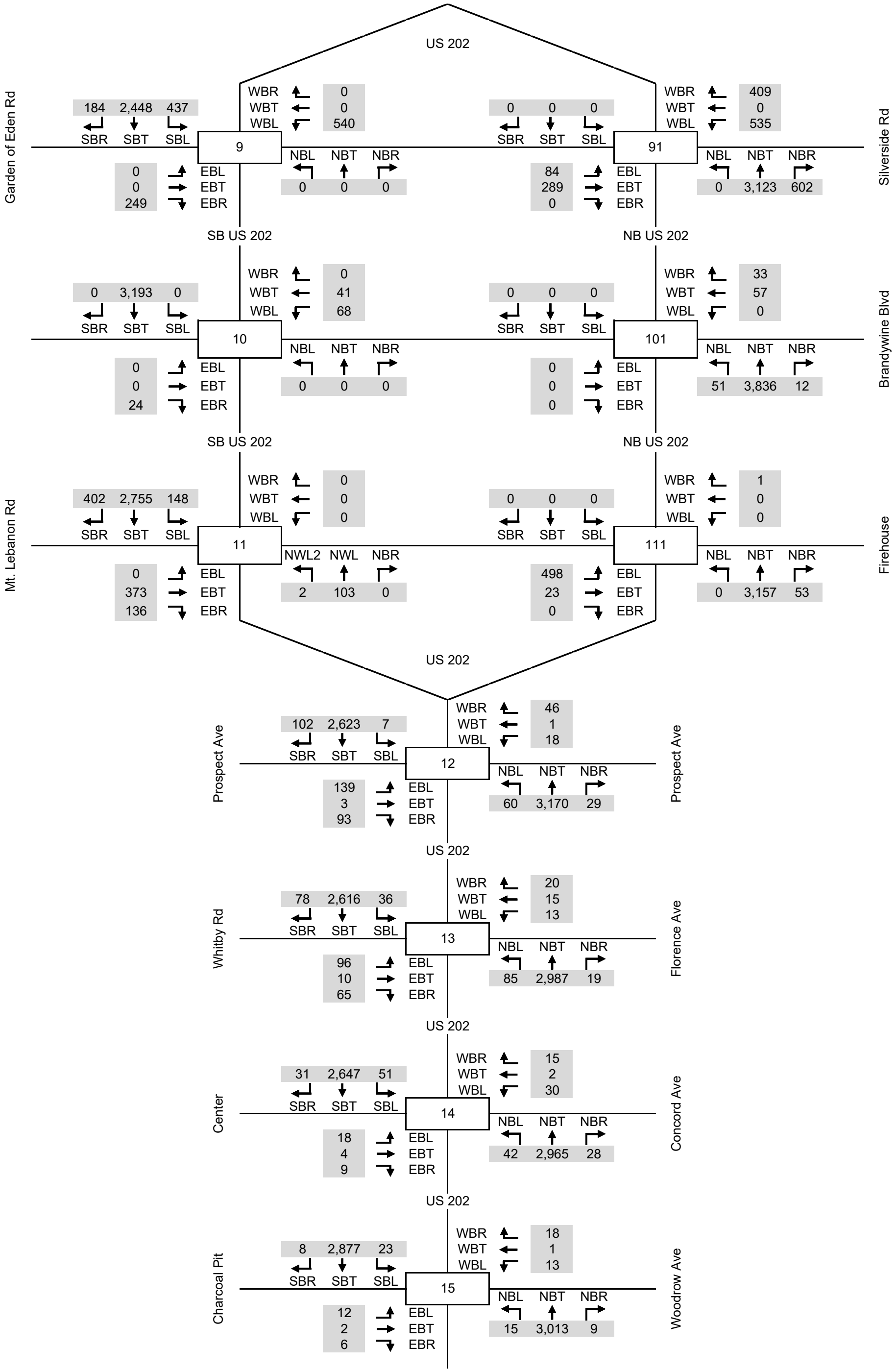

2050 Proposed Zoning High - PM Volumes

Exiting Transportation Infrastructure

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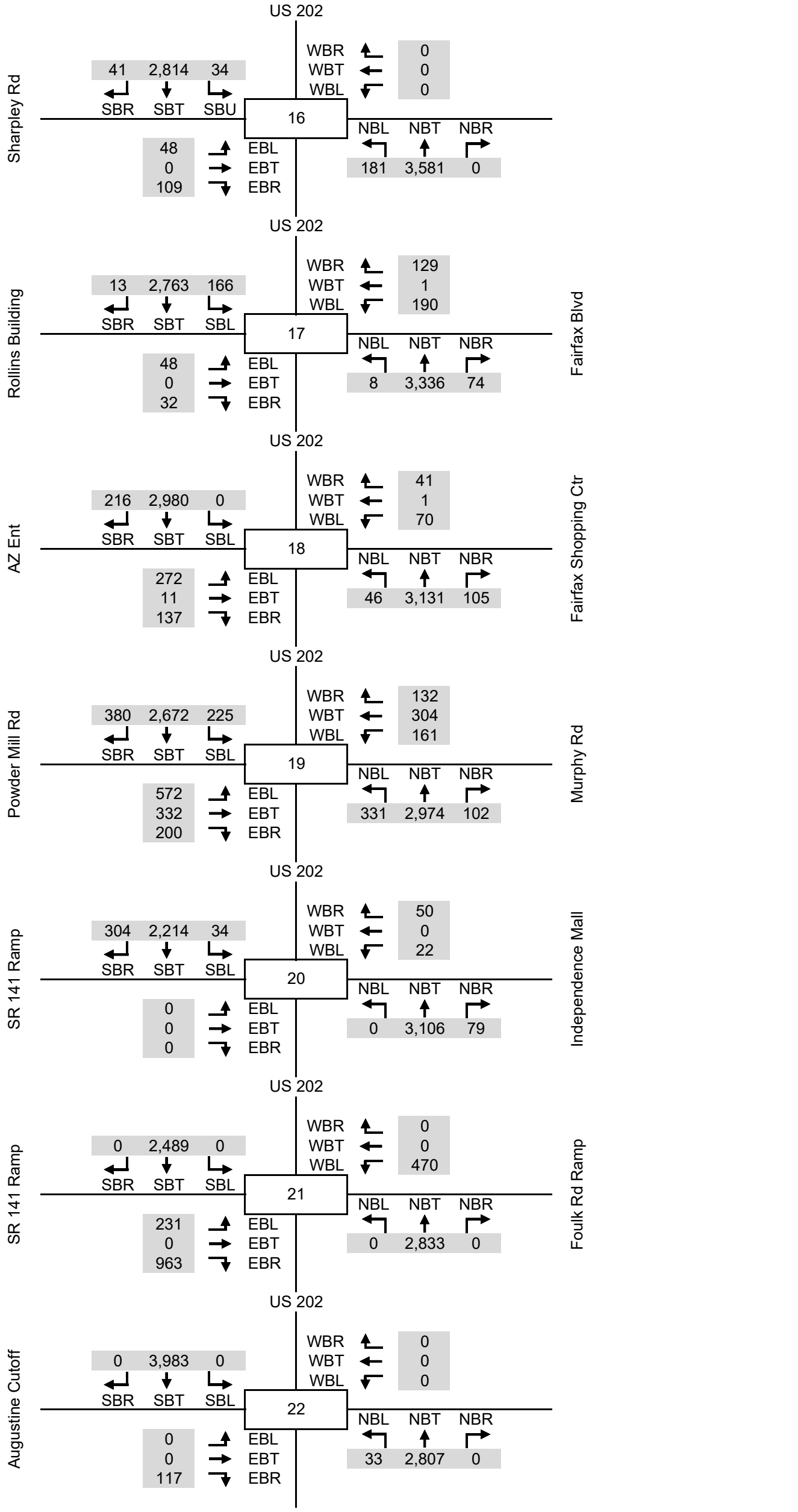

2050 Proposed Zoning High - AM Volumes

Additional Roadway Connections

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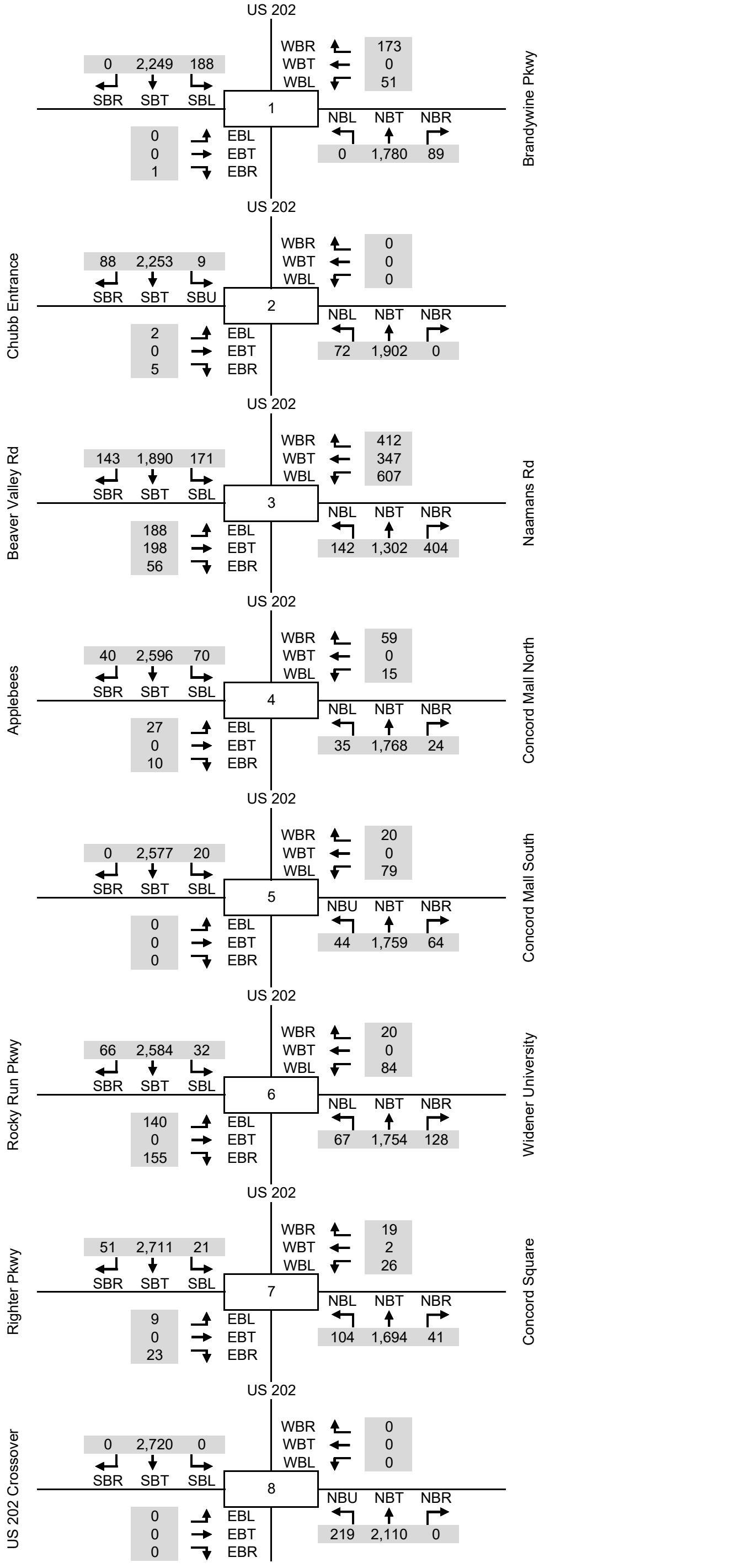

2050 Proposed Zoning High - AM Volumes

Additional Roadway Connections

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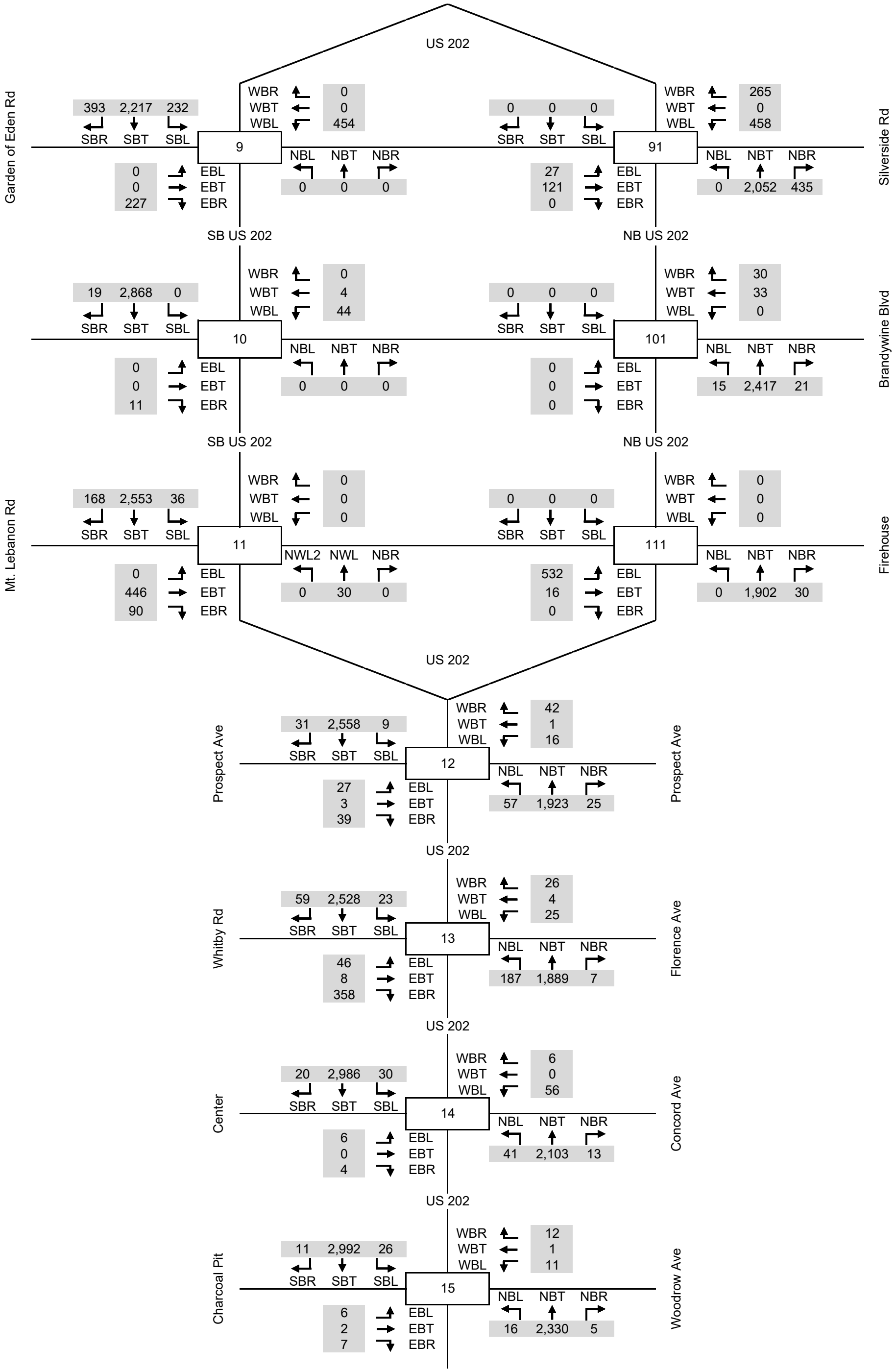

2050 Proposed Zoning High - AM Volumes

Additional Roadway Connections

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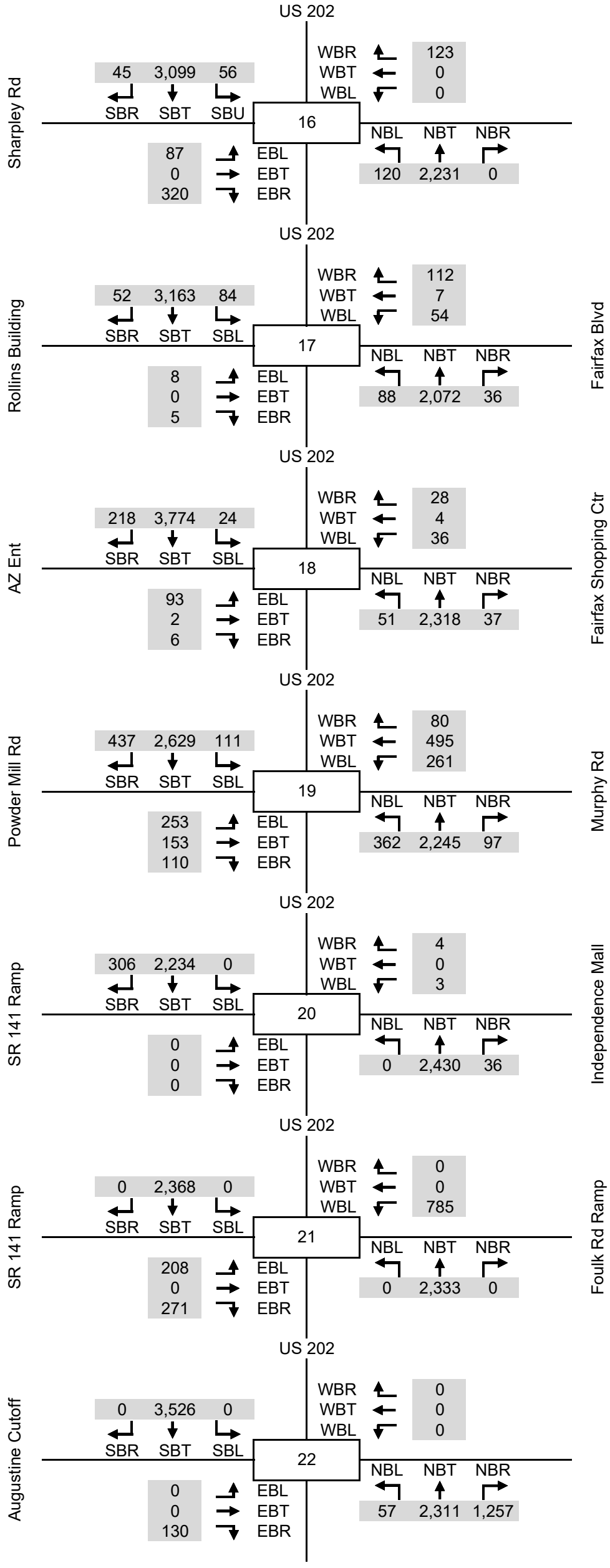

2050 Proposed Zoning High - PM Volumes

Additional Roadway Connections

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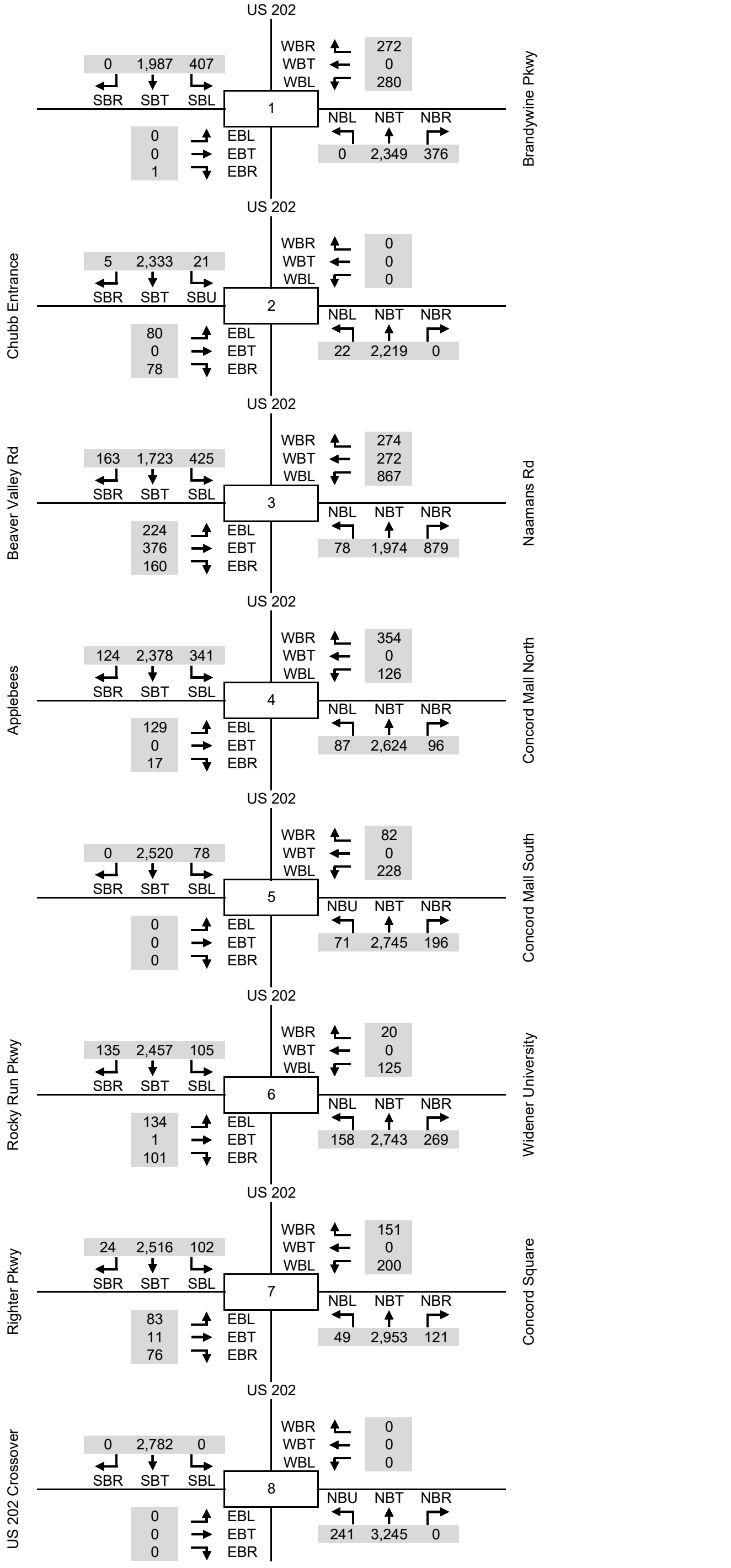

2050 Proposed Zoning High - PM Volumes

Additional Roadway Connections

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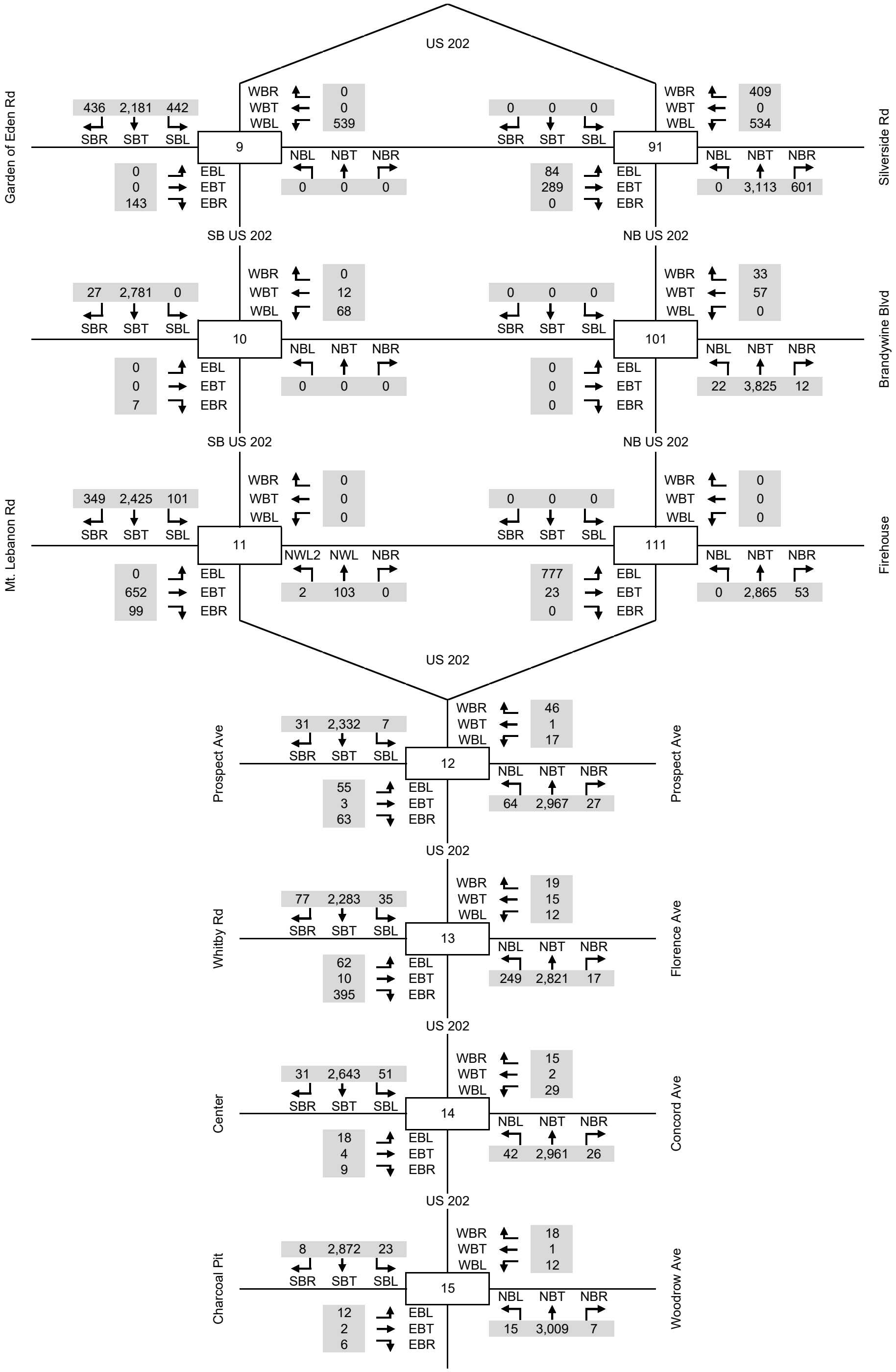

2050 Proposed Zoning High - PM Volumes

Additional Roadway Connections

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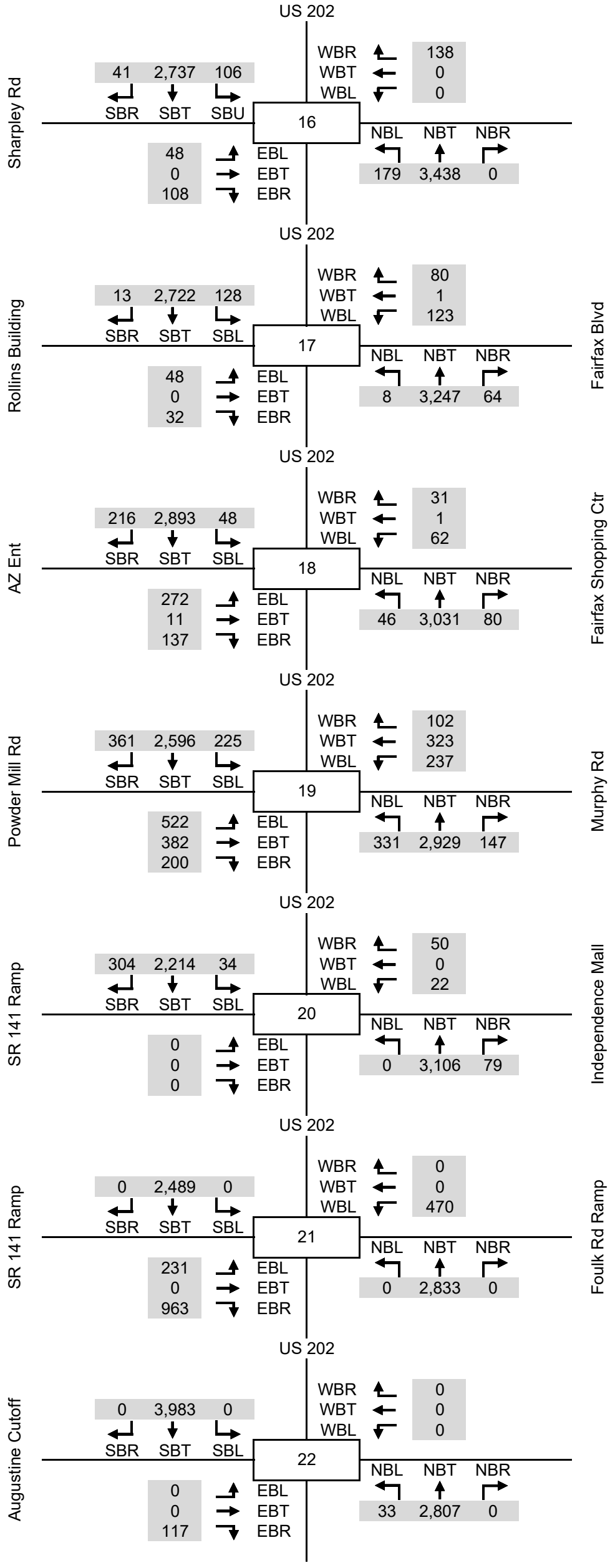

2050 Proposed Zoning High - AM Volumes

Additional Roadway and Ped/Bike Connections

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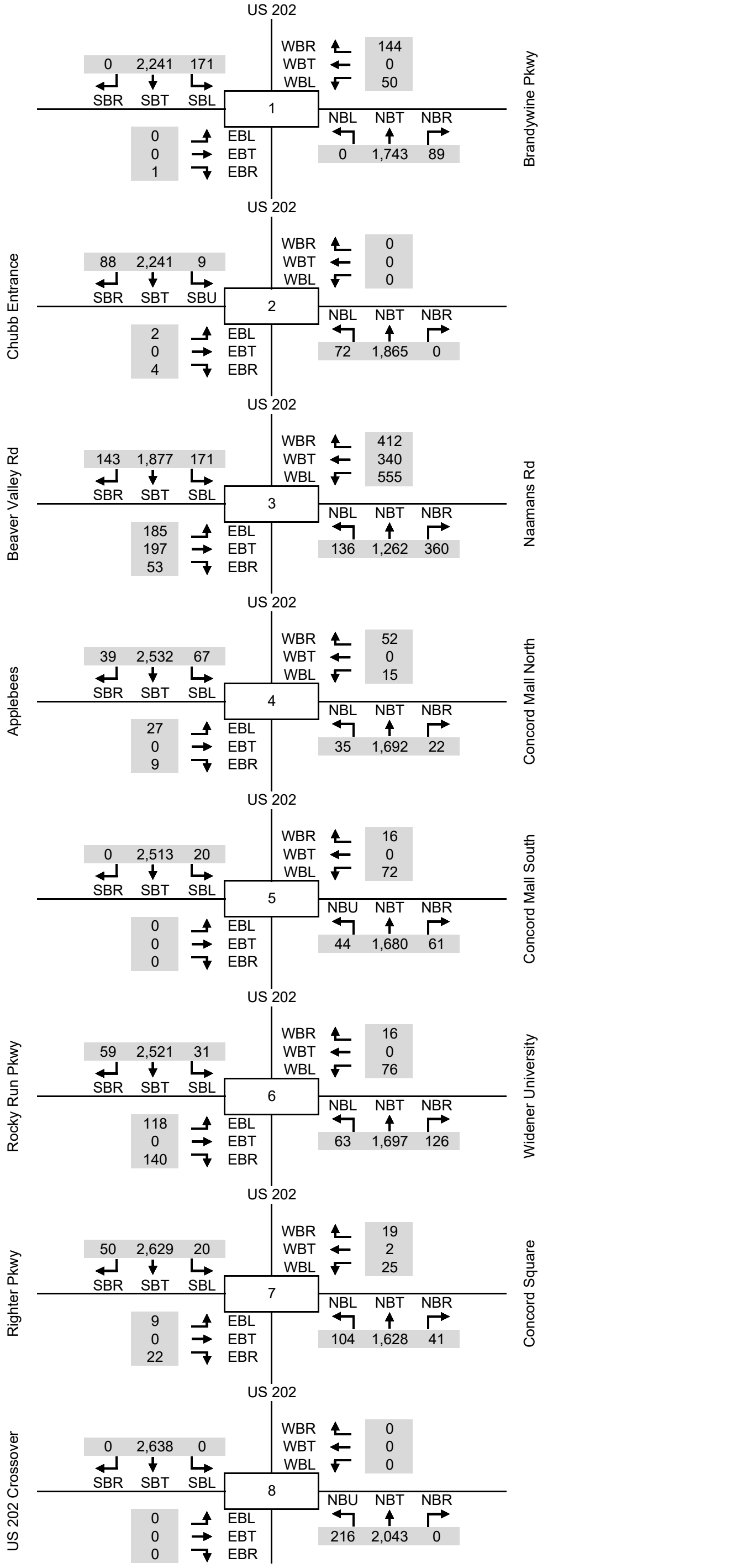
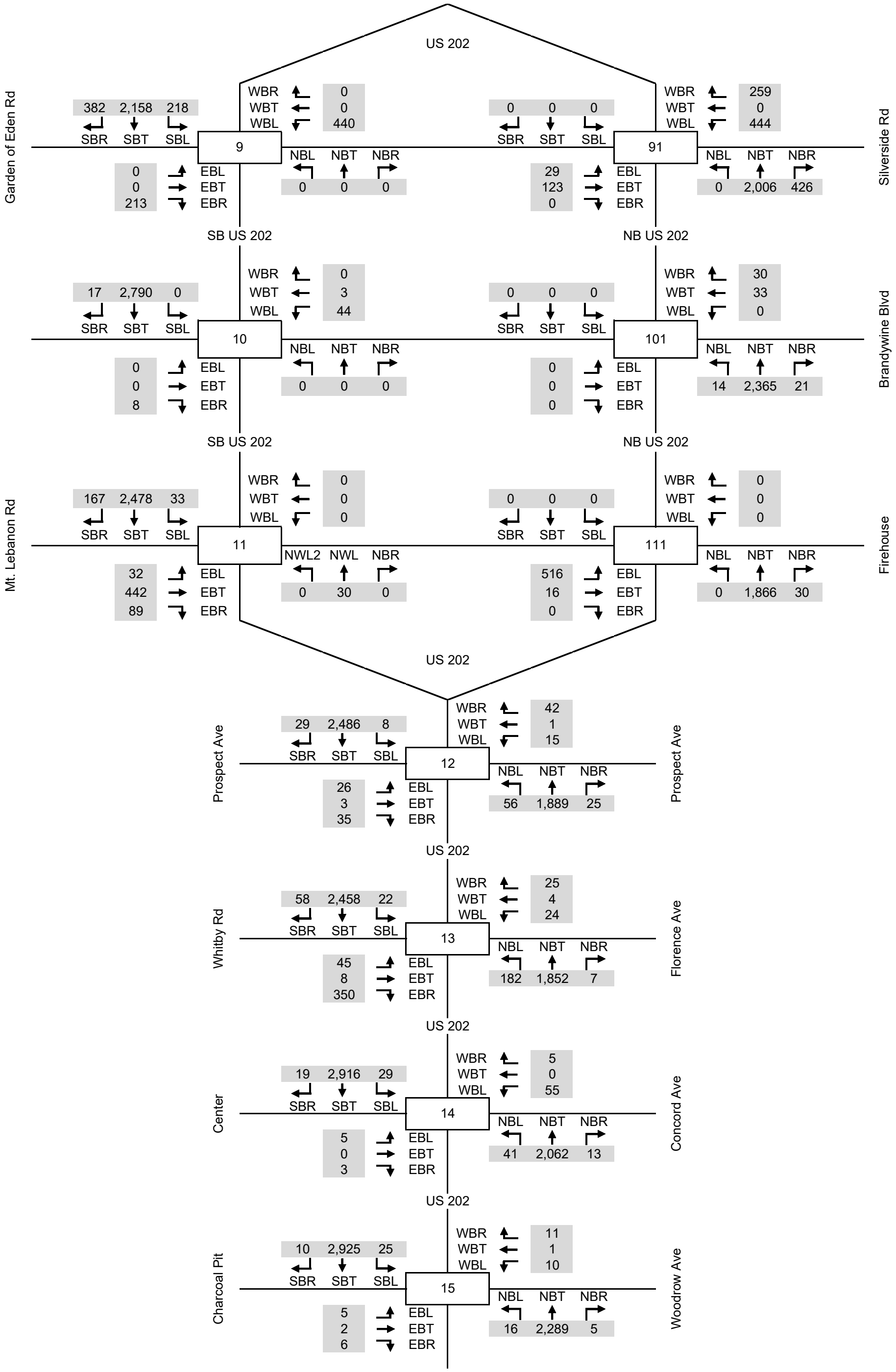


2050 Proposed Zoning High - AM Volumes

Additional Roadway and Ped/Bike Connections

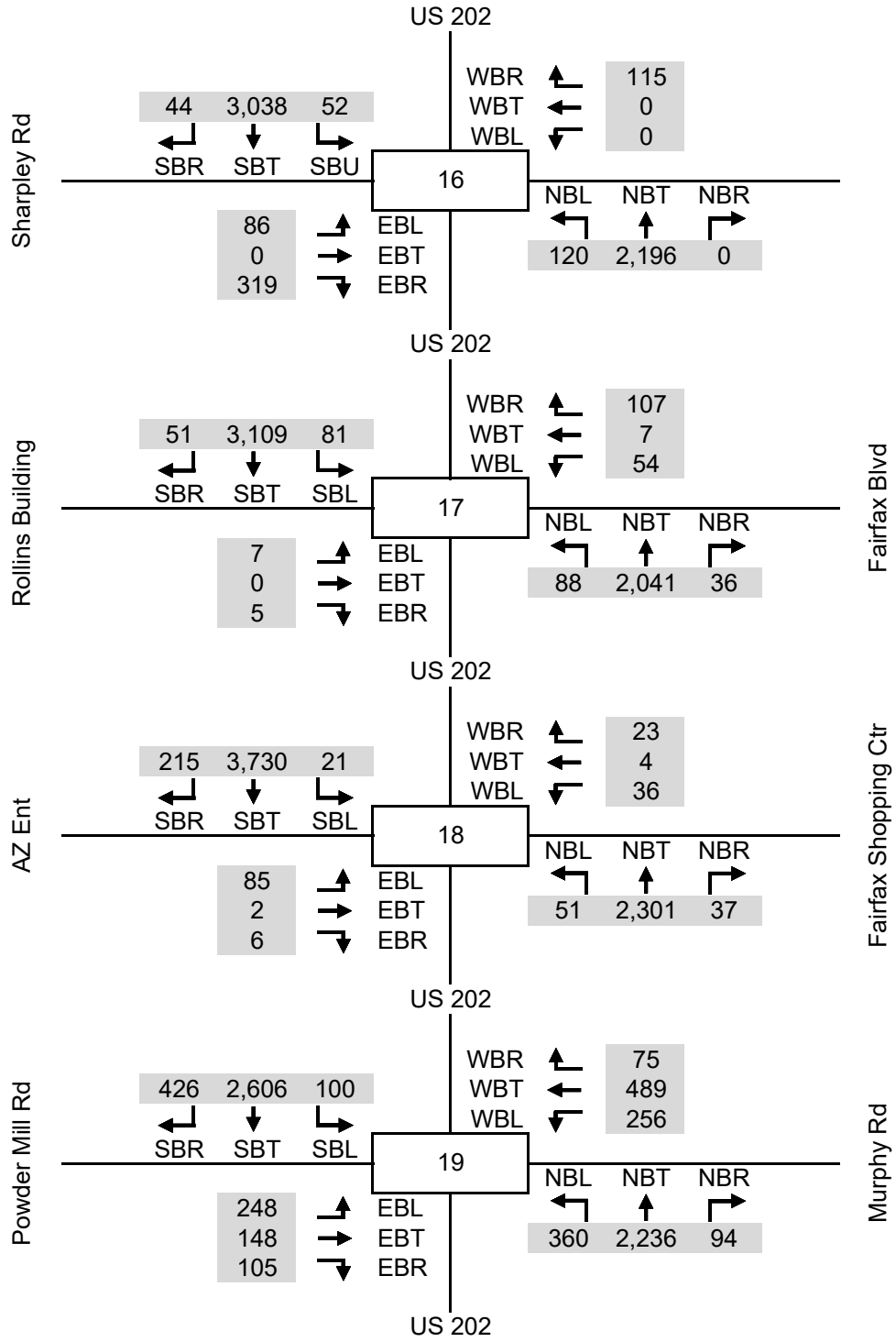
N



2050 Proposed Zoning High - AM Volumes

Additional Roadway and Ped/Bike Connections

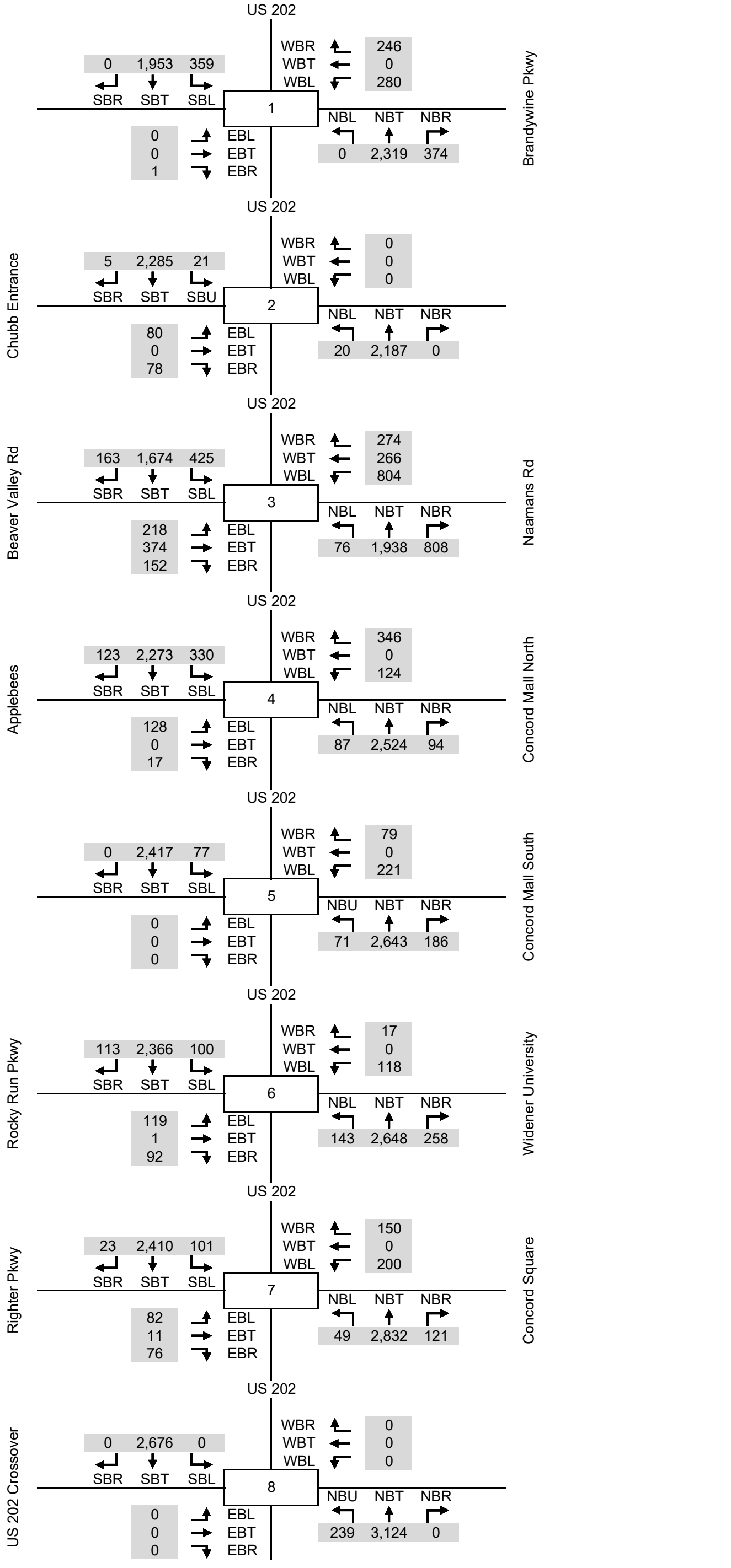
N



2050 Proposed Zoning High - PM Volumes

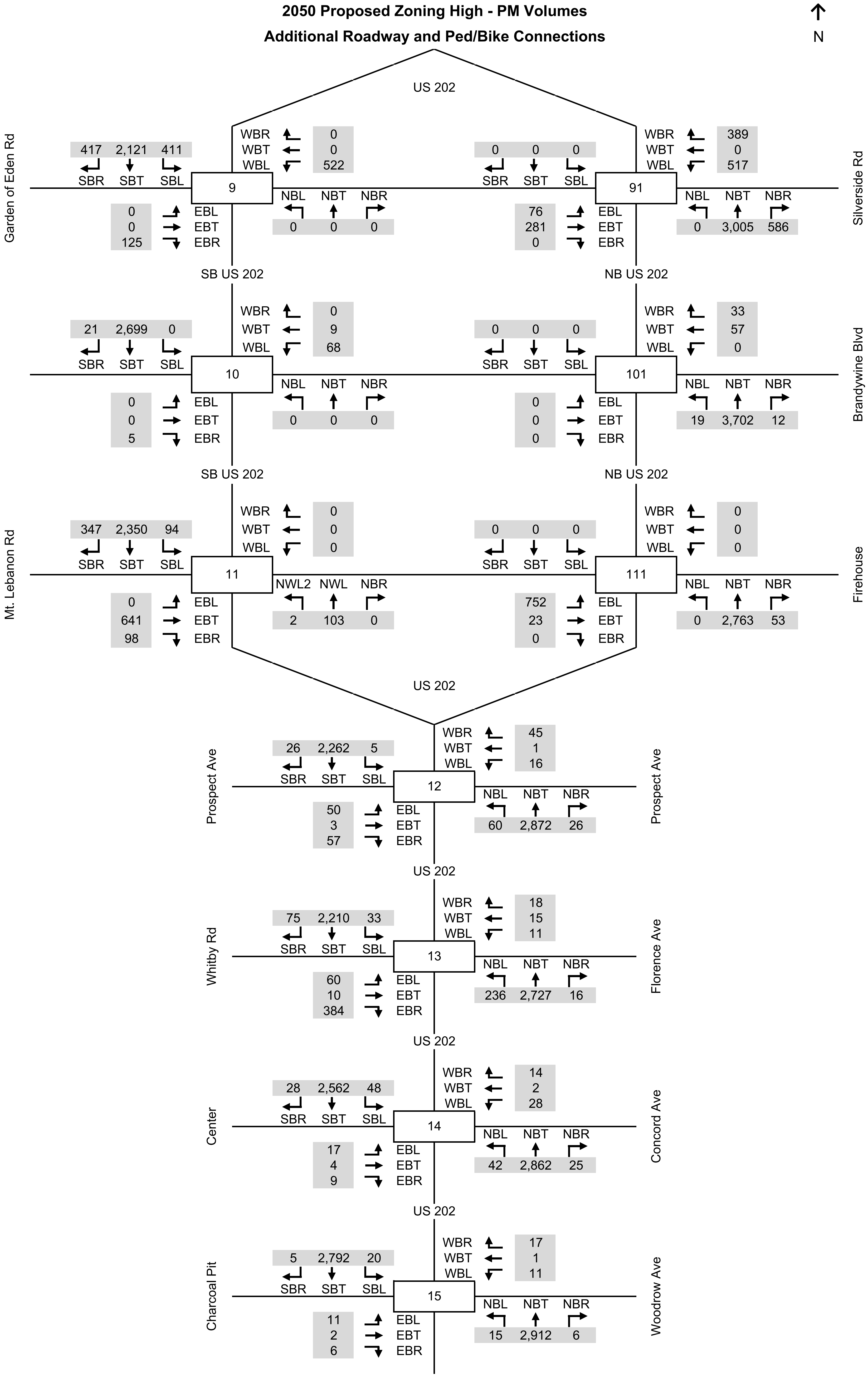
Additional Roadway and Ped/Bike Connections

N



2050 Proposed Zoning High - PM Volumes

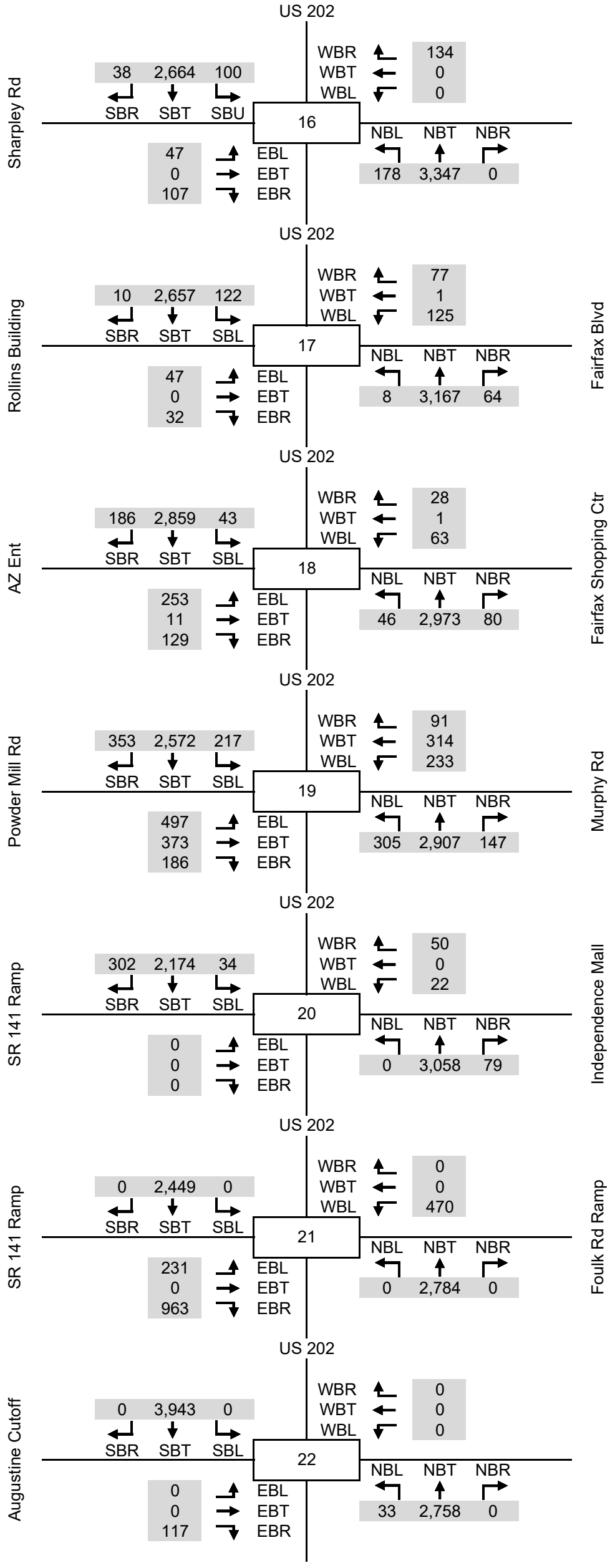
Additional Roadway and Ped/Bike Connections



2050 Proposed Zoning High - PM Volumes

Additional Roadway and Ped/Bike Connections

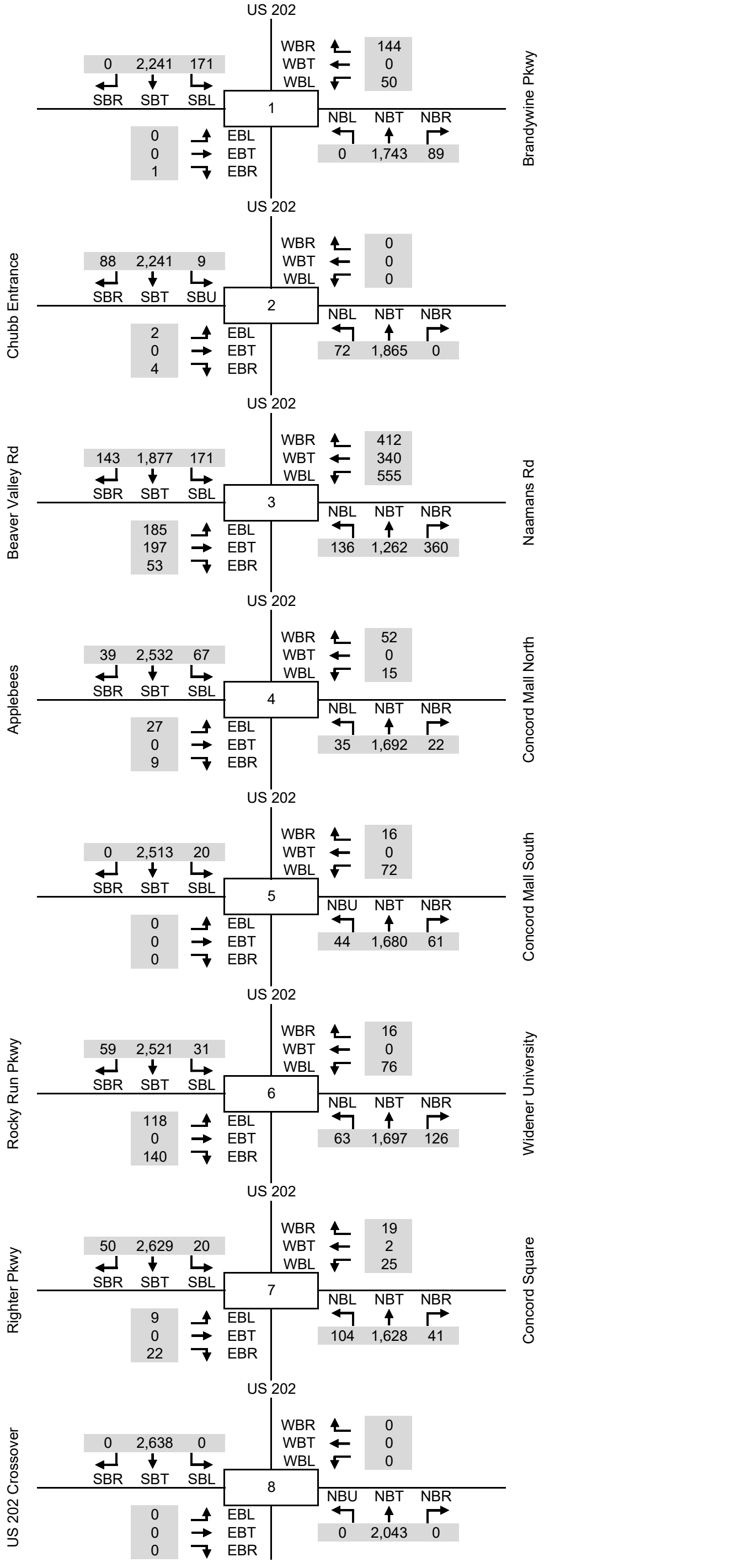
N



2050 Proposed Zoning High - AM Volumes

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

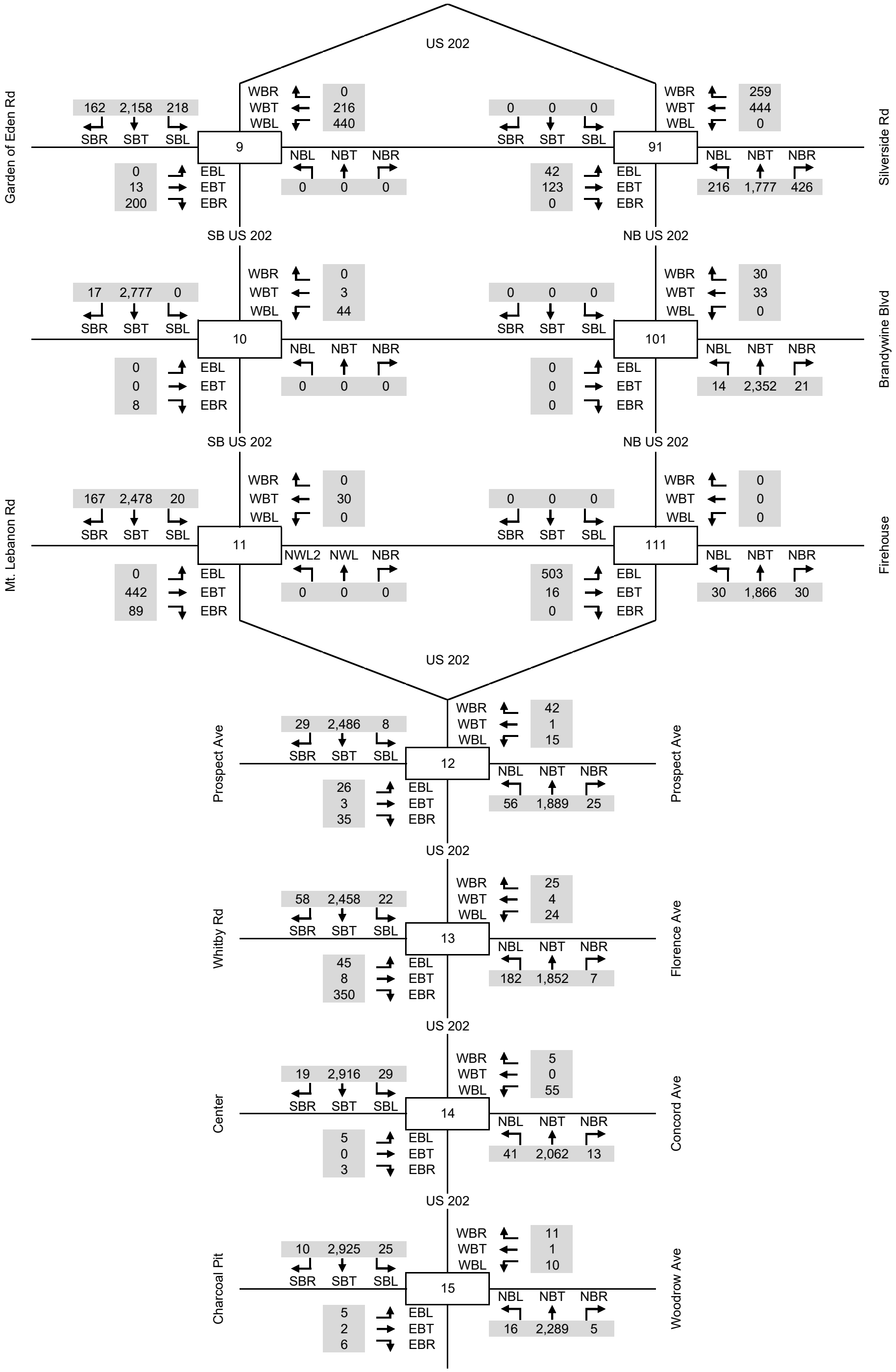
N



2050 Proposed Zoning High - AM Volumes

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

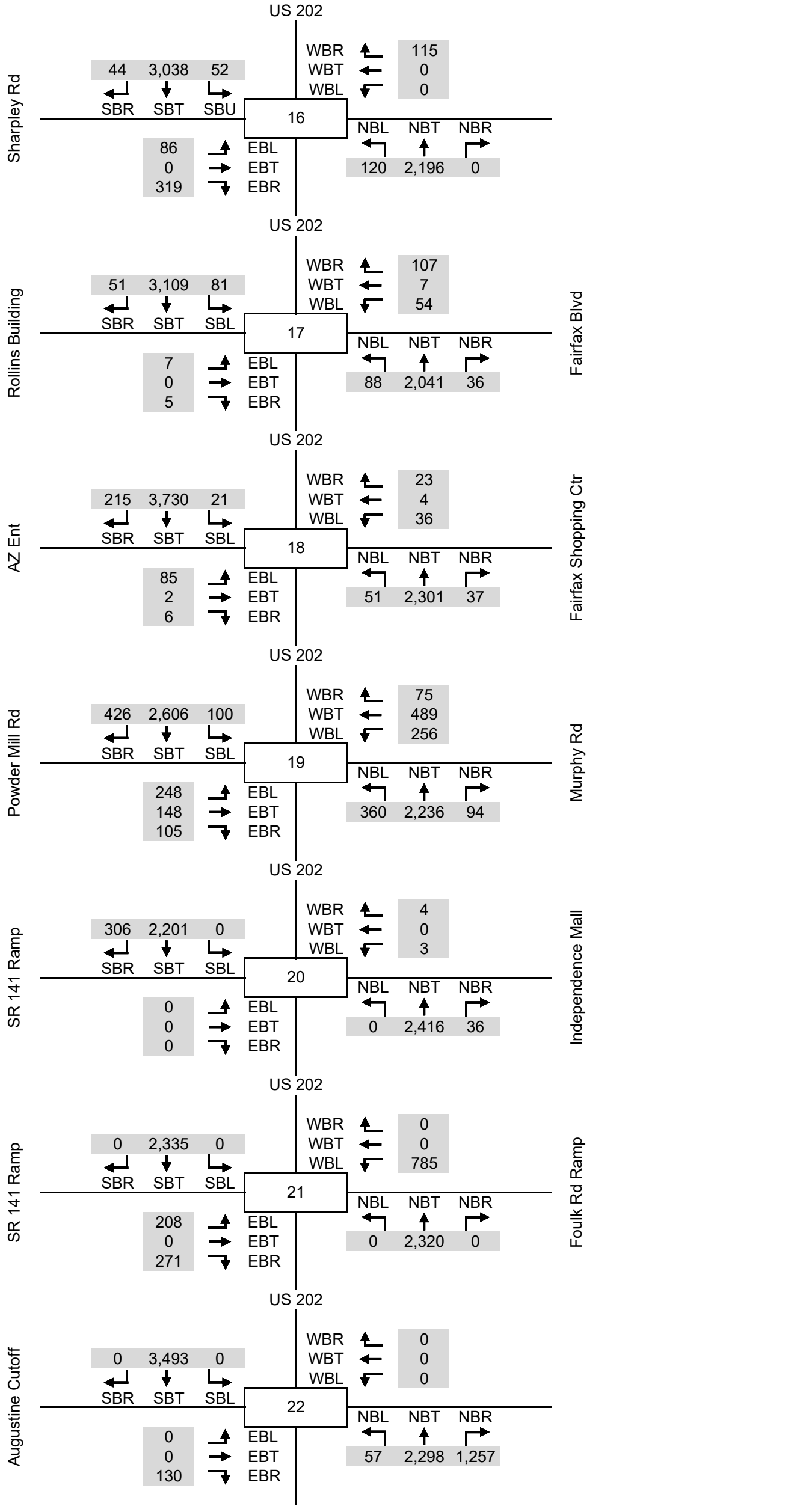
N



2050 Proposed Zoning High - AM Volumes

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

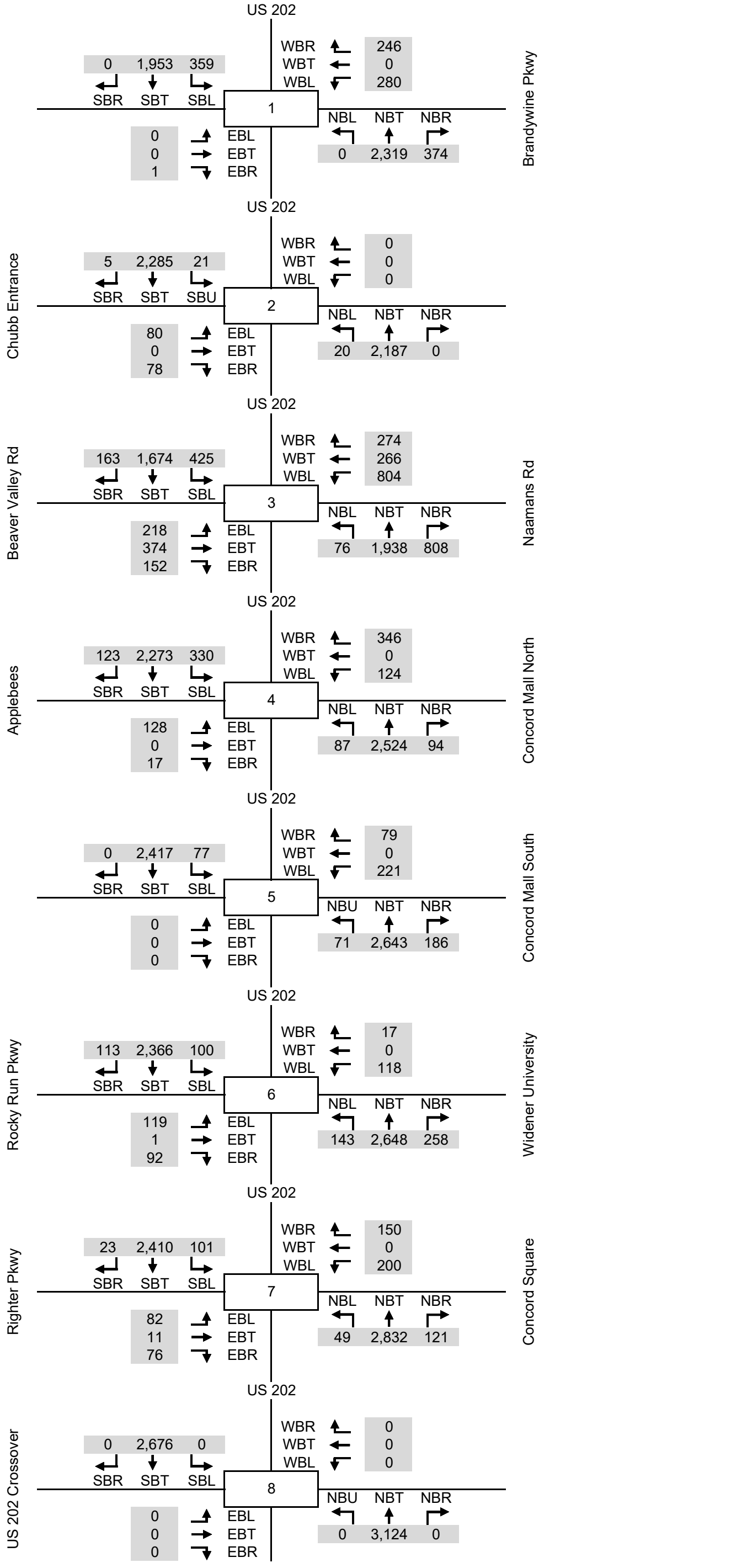
N



2050 Proposed Zoning High - PM Volumes

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

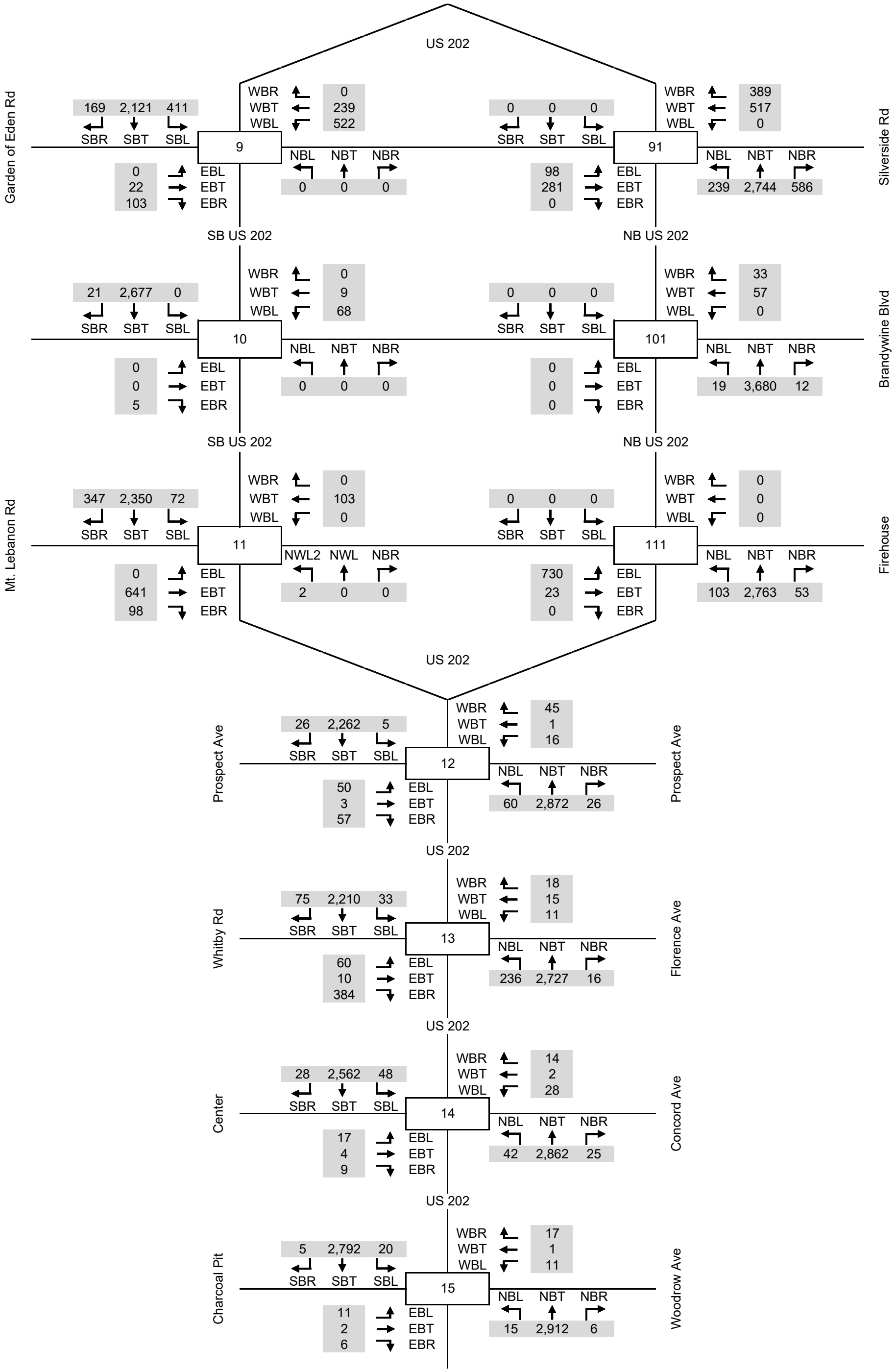
N



2050 Proposed Zoning High - PM Volumes

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

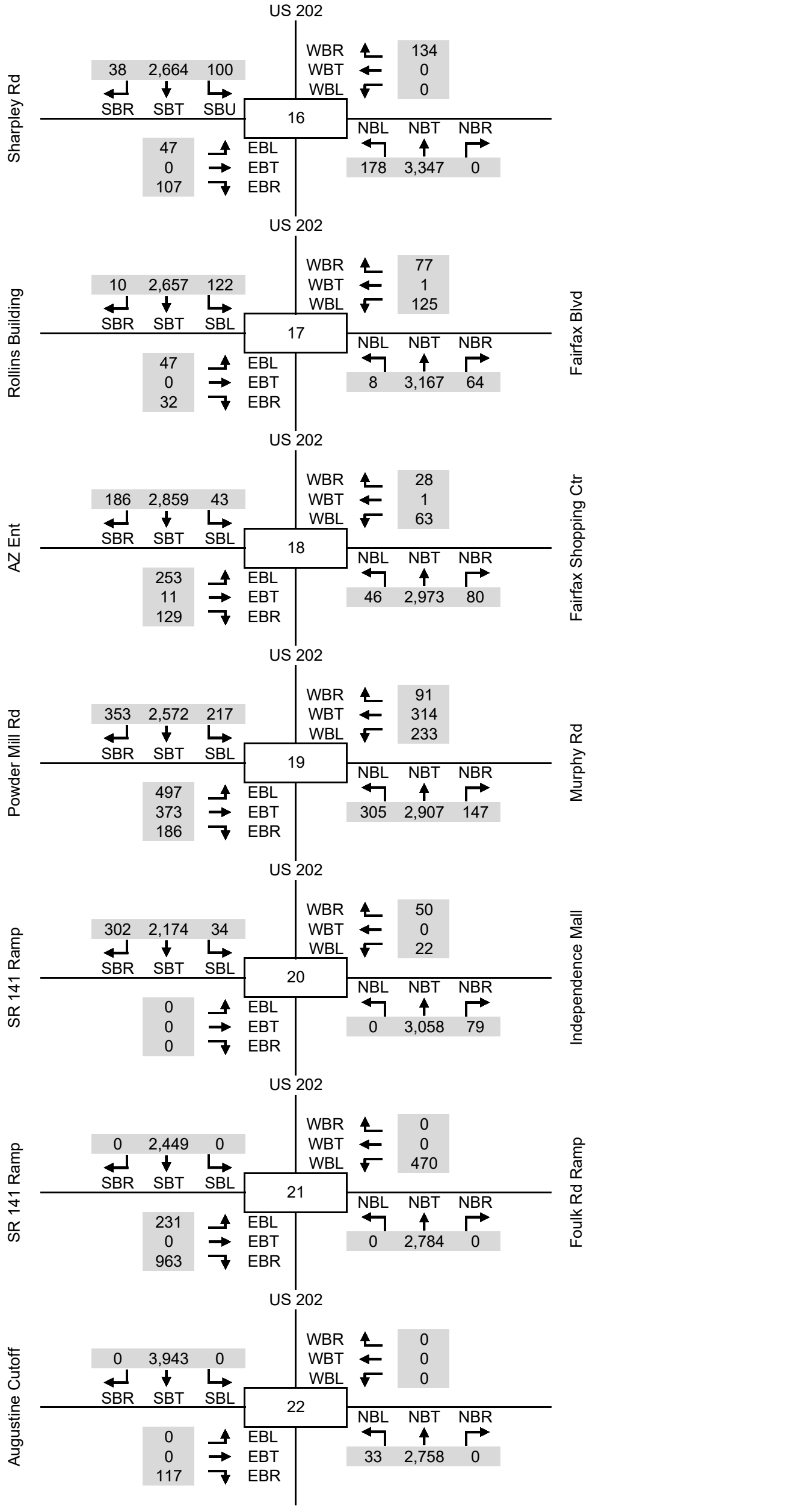
N



2050 Proposed Zoning High - PM Volumes

Additional Roadway and Ped/Bike Connections and Multimodal Improvements

N



Appendix E

Detailed LOS Tables

Intersection Level of Service Results

Int #	Intersection Name	2019 Existing Conditions														2050 Baseline													
		AM							PM							AM							PM						
		Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB
1	US 202 & Brandywine Pkwy	HCM 6	A	9.8	*NA*	D	A	B	HCM 6	B	18.7	*NA*	D	B	B	HCM 6	B	10.4	*NA*	D	A	B	HCM 6	B	19.3	*NA*	D	B	B
2	US 202 & Chubb Ent	Synchro	A	1.0	**E**	*NA*	A	A	Synchro	A	6.9	D	*NA*	A	A	Synchro	A	1.1	**E**	*NA*	A	A	Synchro	A	8.0	D	*NA*	A	A
3	US 202 & SR 92 Naamans Rd	HCM 6	C	31.4	**E**	**E**	A	C	HCM 6	D	44.3	**E**	**E**	B	D	HCM 6	C	30.9	**E**	**E**	A	C	HCM 6	D	51.9	**E**	**E**	D	D
4	US 202 & Concord Mall North	Synchro	A	5.7	D	B	A	A	Synchro	B	17.5	**E**	B	B	B	Synchro	A	6.8	D	B	A	A	Synchro	B	18.9	**E**	B	C	B
5	US 202 & Concord Mall South	Synchro	A	4.0	*NA*	**E**	A	A	Synchro	A	8.2	*NA*	**E**	A	A	Synchro	A	3.8	*NA*	**E**	A	A	Synchro	B	10.9	*NA*	**E**	B	B
6	US 202 & Rocky Run Pkwy/Widener U	HCM 6	D	38.2	**E**	**E**	C	D	HCM 6	D	42.5	**E**	**E**	C	D	HCM 6	D	42.7	**E**	**E**	C	D	HCM 6	D	46.9	**E**	**E**	D	**E**
7	US 202 & Righter Pkwy/Concord Square	Synchro	C	24.9	B	D	C	C	Synchro	C	29.2	C	D	C	C	Synchro	C	26.2	B	D	C	C	Synchro	C	31.5	C	D	D	C
8	US 202 SB & NB U-turn	Synchro	B	11.5	*NA*	D	*NA*	A	Synchro	B	13.2	*NA*	**E**	*NA*	A	Synchro	B	12.4	*NA*	**E**	*NA*	A	Synchro	B	14.2	*NA*	**E**	*NA*	A
91	US 202 NB & Silverside Rd	Synchro	C	26.7	C	D	B	*NA*	Synchro	C	34.1	**E**	**E**	C	*NA*	Synchro	C	27.3	C	D	C	*NA*	Synchro	**E**	63.8	**E**	**E**	**E**	*NA*
9	US 202 SB & Garden of Eden Rd	Synchro	C	21.7	D	A	*NA*	C	Synchro	B	16.3	D	B	*NA*	B	Synchro	C	24.1	D	A	*NA*	C	Synchro	B	17.7	D	B	*NA*	B
101	US 202 NB & Brandywine Blvd	Synchro	A	4.6	*NA*	**E**	A	*NA*	Synchro	A	5.8	*NA*	**E**	A	*NA*	Synchro	A	4.6	*NA*	**E**	A	*NA*	Synchro	B	10.9	*NA*	**E**	A	*NA*
10	US 202 SB & Brandywine Blvd	Synchro	A	2.4	*NA*	C	*NA*	A	Synchro	A	4.6	*NA*	A	*NA*	A	Synchro	A	2.4	*NA*	C	*NA*	A	Synchro	A	4.7	*NA*	A	*NA*	A
111	US 202 NB & Mt Lebanon Rd	Synchro	B	14.0	A	*NA*	B	*NA*	Synchro	C	31.5	A	*NA*	D	*NA*	Synchro	B	15.6	A	*NA*	B	*NA*	Synchro	**E**	63.9	A	*NA*	**E**	*NA*
11	US 202 SB & Mt Lebanon Rd	Synchro	B	16.3	D	*NA*	*NA*	*NA*	Synchro	C	24.7	D	*NA*	*NA*	*NA*	Synchro	B	18.6	D	*NA*	**E**	B	Synchro	C	27.3	D	*NA*	B	C
12	US 202 & Prospect Ave	Synchro	A	9.1	B	C	A	B	Synchro	B	10.1	B	C	A	B	Synchro	B	10.1	B	C	A	B	Synchro	B	11.4	B	C	B	B
13	US 202 & Whitby Rd/Florence Ave	HCM 6	D	37.4	**F**	**E**	C	C	HCM 6	D	40.2	**F**	D	C	C	HCM 6	D	40.9	**F**	**E**	C	D	HCM 6	D	45.2	**F**	D	D	C
14	US 202 & Concord Ave	HCM 6	B	11.6	**E**	**E**	C	A	HCM 6	C	20.4	**E**	**E**	C	B	HCM 6	B	14.8	**E**	**E**	C	A	HCM 6	C	23.9	**E**	**E**	C	B
15	US 202 & Woodrow Ave	HCM 6	A	2.5	**E**	**E**	A	A	HCM 6	A	3.1	**E**	**E**	A	A	HCM 6	A	6.1	**E**	**E**	A	A	HCM 6	A	9.0	**E**	**E**	A	A
16	US 202 & Sharpley Rd	Synchro	B	12.3	C	*NA*	B	B	Synchro	B	14.9	D	*NA*	B	A	Synchro	B	13.8	C	*NA*	B	B	Synchro	B	17.4	C	*NA*	C	A
17	US 202 & Fairfax Blvd	Synchro	C	34.3	B	D	A	D	Synchro	C	28.6	D	D	D	B	Synchro	D	40.0	B	D	A	**E**	Synchro	**E**	56.9	D	**E**	**F**	C
18	US 202 & AZ Ent/Fairfax Shopping Ctr	Synchro	D	54.1	B	**E**	B	**E**	Synchro	C	29.1	D	**F**	C	B	Synchro	**E**	56.6	B	**E**	B	**E**	Synchro	D	36.4	D	**F**	D	C
19	US 202 & Powder Mill Rd/Murphy Rd	HCM 6	D	46.8	**E**	**F**	D	C	HCM 6	**E**	58.1	**E**	**F**	**E**	D	HCM 6	D	47.2	**E**	**F**	D	C	HCM 6	**E**	76.9	**E**	**F**	**F**	D
20	US 202 & Independence Mall	HCM 6	A	4.7	*NA*	**E**	A	A	HCM 6	A	6.1	*NA*	**E**	A	B	HCM 6	A	5.3	*NA*	**E**	A	B	HCM 6	A	5.9	*NA*	**E**	A	B
21	US 202 & Foulk Rd	Synchro	C	20.9	D	**E**	B	A	Synchro	B	14.7	D	**E**	B	A	Synchro	C	21.7	D	**E**	C	A	Synchro	B	15.2	D	**E**	B	A
22	US 202 & Augustine Cutoff	Synchro	A	5.1	A	*NA*	**E**	A	Synchro	A	5.9	A	*NA*	**E**	A	Synchro	A	7.7	A	*NA*	**E**	A	Synchro	A	8.1	A	*NA*	**E**	A

Intersection Level of Service Results - 2050 By-Right Development

Int #	Intersection Name	Do Nothing													Enhanced Vehicle Network													
		AM							PM						AM							PM						
		Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB
1	US 202 & Brandywine Pkwy	HCM 6	C	30.8	*NA*	D	D	B	HCM 6	C	23.7	*NA*	D	C	C	HCM 6	B	17.4	*NA*	D	B	B	HCM 6	C	23.8	*NA*	D	C	C
2	US 202 & Chubb Ent	Synchro	A	1.4	D	*NA*	A	A	Synchro	A	7.4	**E**	*NA*	A	A	Synchro	A	1.6	D	*NA*	A	A	Synchro	A	7.1	**E**	*NA*	A	A
3	US 202 & SR 92 Naamans Rd	HCM 6	C	34.3	**E**	**E**	A	C	HCM 6	**E**	66.1	**F**	**F**	D	**E**	HCM 6	C	33.6	**E**	**E**	A	C	HCM 6	**E**	58.4	**F**	**F**	D	D
4	US 202 & Concord Mall North	Synchro	B	10.7	D	C	B	A	Synchro	B	17.7	**F**	C	B	B	Synchro	B	10.5	D	C	B	A	Synchro	B	17.8	**F**	C	B	B
5	US 202 & Concord Mall South	Synchro	A	1.9	*NA*	**E**	A	A	Synchro	A	5.9	*NA*	**E**	A	A	Synchro	A	2.2	*NA*	**E**	A	A	Synchro	A	5.5	*NA*	**E**	A	A
6	US 202 & Rocky Run Pkwy/Widener U	HCM 6	B	16.3	**E**	**E**	C	A	HCM 6	C	26.5	**E**	**F**	D	A	HCM 6	C	20.5	**E**	**F**	C	A	HCM 6	C	34.1	**E**	**F**	D	B
7	US 202 & Righter Pkwy/Concord Square	Synchro	C	27.2	B	C	C	C	Synchro	D	49.2	D	D	D	D	Synchro	C	29.0	B	C	C	C	Synchro	**E**	63.5	D	D	D	**F**
8	US 202 SB & NB U-turn	Synchro	B	13.9	*NA*	**E**	*NA*	B	Synchro	D	37.8	*NA*	**E**	*NA*	D	Synchro	B	13.9	*NA*	**E**	*NA*	B	Synchro	**E**	75.1	*NA*	**F**	*NA*	**E**
91	US 202 NB & Silverside Rd	Synchro	D	40.7	D	**E**	D	*NA*	Synchro	**E**	72.3	**F**	**F**	**E**	*NA*	Synchro	C	28.0	D	D	B	*NA*	Synchro	**E**	75.0	**F**	**F**	**E**	*NA*
9	US 202 SB & Garden of Eden Rd	Synchro	D	40.7	**E**	B	*NA*	D	Synchro	C	21.7	**F**	D	*NA*	B	Synchro	C	20.8	D	A	*NA*	C	Synchro	C	21.8	C	D	*NA*	B
101	US 202 NB & Brandywine Blvd	Synchro	A	4.8	*NA*	**E**	A	*NA*	Synchro	**E**	56.2	*NA*	**F**	**E**	*NA*	Synchro	A	3.6	*NA*	**E**	A	*NA*	Synchro	D	36.6	*NA*	**F**	C	*NA*
10	US 202 SB & Brandywine Blvd	Synchro	A	2.8	*NA*	C	*NA*	A	Synchro	A	4.6	*NA*	C	*NA*	A	Synchro	A	2.9	*NA*	C	*NA*	A	Synchro	B	14.5	*NA*	B	*NA*	B
111	US 202 NB & Mt Lebanon Rd	Synchro	C	23.9	A	*NA*	C	*NA*	Synchro	**F**	89.3	B	*NA*	**F**	*NA*	Synchro	C	23.5	B	*NA*	C	*NA*	Synchro	**F**	84.5	**F**	*NA*	**F**	*NA*
11	US 202 SB & Mt Lebanon Rd	Synchro	C	29.5	D	*NA*	**E**	C	Synchro	D	50.7	D	*NA*	C	D	Synchro	C	30.1	**E**	*NA*	**F**	C	Synchro	D	44.1	**F**	*NA*	C	C
12	US 202 & Prospect Ave	Synchro	B	14.9	D	D	A	B	Synchro	**E**	65.8	**F**	D	**E**	D	Synchro	B	11.3	C	D	A	B	Synchro	B	17.7	D	D	B	B
13	US 202 & Whitby Rd/Florence Ave	HCM 6	D	35.1	**F**	**E**	B	C	HCM 6	D	39.8	**F**	D	C	C	HCM 6	C	32.8	**F**	**E**	C	C	HCM 6	D	39.9	**F**	D	C	C
14	US 202 & Concord Ave	HCM 6	A	4.6	**E**	**E**	A	A	HCM 6	A	5.0	**E**	**E**	A	A	HCM 6	A	4.4	**E**	**E**	A	A	HCM 6	A	4.9	**E**	**E**	A	A
15	US 202 & Woodrow Ave	HCM 6	A	1.0	**E**	**E**	A	A	HCM 6	A	0.9	**E**	**E**	A	A	HCM 6	A	1.0	**E**	**E**	A	A	HCM 6	A	1.0	**E**	**E**	A	A
16	US 202 & Sharpley Rd	Synchro	B	12.8	**E**	*NA*	A	A	Synchro	C	23.4	D	*NA*	C	B	Synchro	B	13.1	**E**	*NA*	A	A	Synchro	C	20.7	D	*NA*	C	A
17	US 202 & Fairfax Blvd	Synchro	C	33.5	D	**F**	C	B	Synchro	**E**	56.0	D	**F**	**E**	C	Synchro	D	43.3	D	**F**	B	D	Synchro	D	36.9	D	**F**	D	B
18	US 202 & AZ Ent/Fairfax Shopping Ctr	Synchro	**F**	85.1	**E**	**F**	C	**F**	Synchro	D	54.3	**E**	**E**	D	**E**	Synchro	**E**	70.9	**E**	**E**	B	**F**	Synchro	D	47.5	**E**	**F**	C	**E**
19	US 202 & Powder Mill Rd/Murphy Rd	HCM 6	**F**	131.7	**E**	**F**	D	C	HCM 6	**F**	105.9	**E**	**F**	**F**	D	HCM 6	**F**	136.3	**E**	**F**	C	C	HCM 6	**F**	105.6	**E**	**F**	**F**	D
20	US 202 & Independence Mall	HCM 6	A	6.7	*NA*	**E**	A	B	HCM 6	A	8.2	*NA*	**E**	A	B	HCM 6	A	6.7	*NA*	**E**	A	B	HCM 6	A	8.2	*NA*	**E**	A	B
21	US 202 & Foulk Rd	Synchro	C	22.3	D	**E**	C	A	Synchro	C	20.1	D	**E**	B	B	Synchro	C	27.7	D	**E**	C	C	Synchro	B	15.2	D	**E**	B	A
22	US 202 & Augustine Cutoff	Synchro	B	11.5	A	*NA*	**E**	B	Synchro	A	8.3	A	*NA*	**E**	A	Synchro	A	7.4	A	*NA*	**E**	A	Synchro	B	11.2	A	*NA*	**E**	B

Int #	Intersection Name	Enhanced Ped/Bike Network													
		AM							PM						
		Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB
1	US 202 & Brandywine Pkwy	HCM 6	B	12.5	*NA*	D	A	B	HCM 6	B	14.7	*NA*	D	A	C
2	US 202 & Chubb Ent	Synchro	A	4.9	D	*NA*	A	A	Synchro	A	6.6	**E**	*NA*	A	A
3	US 202 & SR 92 Naamans Rd	HCM 6	C	32.9	**E**	**E**	A	C	HCM 6	**E**	60.8	**F**	**E**	D	D
4	US 202 & Concord Mall North	Synchro	B	10.4	D	C	B	A	Synchro	B	16.4	**F**	C	A	B
5	US 202 & Concord Mall South	Synchro	A	2.0	*NA*	**E**	A	A	Synchro	A	5.7	*NA*	**E**	A	B
6	US 202 & Rocky Run Pkwy/Widener U	HCM 6	C	20.0	**E**	**F**	C	A	HCM 6	C	30.2	**E**	**F**	D	B
7	US 202 & Righter Pkwy/Concord Square	Synchro	C	28.7	B	C	C	C	Synchro	**E**	59.5	D	D	D	**F**
8	US 202 SB & NB U-turn	Synchro	B	13.7	*NA*	**E**	*NA*	A	Synchro	**E**	59.8	*NA*	**F**	*NA*	**E**
91	US 202 NB & Silverside Rd	Synchro	C	25.5	D	D	B	*NA*	Synchro	**E**	67.9	**F**	**F**	**E**	*NA*
9	US 202 SB & Garden of Eden Rd	Synchro	B	19.5	D	A	*NA*	B	Synchro	C	20.2	C	D	*NA*	B
101	US 202 NB & Brandywine Blvd	Synchro	A	4.4	*NA*	**E**	A	*NA*	Synchro	B	17.9	*NA*	**F**	B	*NA*
10	US 202 SB & Brandywine Blvd	Synchro	A	4.2	*NA*	C	*NA*	A	Synchro	A	5.4	*NA*	B	*NA*	A
111	US 202 NB & Mt Lebanon Rd	Synchro	C	23.0	B	*NA*	C	*NA*	Synchro	**F**	85.1	**F**	*NA*	**F**	*NA*
11	US 202 SB & Mt Lebanon Rd	Synchro	C	28.5	**E**	*NA*	**F**	C	Synchro	D	49.4	**F**	*NA*	C	C
12	US 202 & Prospect Ave	Synchro	B	11.0	C	D	A	B	Synchro	B	15.6	D	D	B	B
13	US 202 & Whitby Rd/Florence Ave	HCM 6	C	31.6	**F**	**E**	C	C	HCM 6	D	38.2	**F**	D	C	C
14	US 202 & Concord Ave	HCM 6	A	4.4	**E**	**E**	A	A	HCM 6	A	5.0	**E**	**E**	A	A
15	US 202 & Woodrow Ave	HCM 6	A	1.0	**E**	**E**	A	A	HCM 6	A	0.9	**E**	**E**	A	A
16	US 202 & Sharpley Rd	Synchro	B	12.9	**E**	*NA*	A	A	Synchro	B	18.7	D	*NA*	C	A
17	US 202 & Fairfax Blvd	Synchro	D	39.9	D	**F**	B	D	Synchro	C	34.1	D	**F**	D	B
18	US 202 & AZ Ent/Fairfax Shopping Ctr	Synchro	**E**	66.1	**E**	**E**	B	**F**	Synchro	D	40.9	D	**F**	C	**E**
19	US 202 & Powder Mill Rd/Murphy Rd	HCM 6	**F**	133.3	**E**	**F**	C	C	HCM 6	**F**	100.9	**E**	**F**	**F**	D
20	US 202 & Independence Mall	HCM 6	A	6.6	*NA*	**E**	A	B	HCM 6	A	8.0	*NA*	**E**	A	B
21	US 202 & Foulk Rd	Synchro	C	26.9	D	**E**	C	C	Synchro	B	16.3	D	**E**	B	A
22	US 202 & Augustine Cutoff	Synchro	A	7.4	A	*NA*	**E**	A	Synchro	B	12.1	A	*NA*	**E**	B

Intersection Level of Service Results - 2050 Proposed Zoning - Low Development

Int #	Intersection Name	Do Nothing													Enhanced Vehicle Network													
		AM							PM						AM							PM						
		Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB
1	US 202 & Brandywine Pkwy	HCM 6	C	30.3	NA	D	D	B	HCM 6	C	22.8	NA	D	C	C	HCM 6	B	15.8	NA	D	B	B	HCM 6	C	24.0	NA	D	C	C
2	US 202 & Chubb Ent	Synchro	A	1.4	D	NA	A	A	Synchro	A	7.7	E	NA	A	A	Synchro	A	1.6	D	NA	A	A	Synchro	A	7.4	E	NA	A	A
3	US 202 & SR 92 Naamans Rd	HCM 6	C	34.3	E	E	A	C	HCM 6	E	63.8	F	E	E	E	HCM 6	C	33.5	E	E	A	C	HCM 6	E	55.6	F	E	D	D
4	US 202 & Concord Mall North	Synchro	B	10.3	D	C	B	A	Synchro	B	18.5	F	C	B	B	Synchro	B	10.4	D	C	B	A	Synchro	B	20.0	F	C	B	C
5	US 202 & Concord Mall South	Synchro	A	2.8	NA	D	A	A	Synchro	A	6.6	NA	E	A	B	Synchro	A	3.3	NA	E	A	A	Synchro	A	6.0	NA	E	A	A
6	US 202 & Rocky Run Pkwy/Widener U	HCM 6	C	23.4	E	F	C	A	HCM 6	C	26.4	E	F	D	A	HCM 6	C	32.4	E	F	C	A	HCM 6	C	33.4	E	F	D	A
7	US 202 & Righter Pkwy/Concord Square	Synchro	C	27.7	B	C	C	C	Synchro	D	50.7	D	D	E	D	Synchro	C	28.5	B	C	C	C	Synchro	E	65.4	D	D	D	F
8	US 202 SB & NB U-turn	Synchro	B	14.6	NA	E	NA	B	Synchro	C	28.6	NA	E	NA	C	Synchro	B	14.6	NA	E	NA	B	Synchro	E	64.7	NA	E	NA	E
91	US 202 NB & Silverside Rd	Synchro	C	33.7	C	E	C	NA	Synchro	E	75.1	F	F	E	NA	Synchro	C	25.7	C	D	B	NA	Synchro	E	74.7	F	F	E	NA
9	US 202 SB & Garden of Eden Rd	Synchro	D	43.8	E	B	NA	D	Synchro	C	21.6	F	D	NA	B	Synchro	C	20.7	D	A	NA	C	Synchro	C	20.5	C	D	NA	B
101	US 202 NB & Brandywine Blvd	Synchro	A	4.5	NA	E	A	NA	Synchro	E	57.1	NA	F	E	NA	Synchro	A	3.5	NA	E	A	NA	Synchro	E	70.8	NA	F	D	NA
10	US 202 SB & Brandywine Blvd	Synchro	A	2.6	NA	C	NA	A	Synchro	A	4.6	NA	C	NA	A	Synchro	A	2.9	NA	C	NA	A	Synchro	B	14.2	NA	B	NA	B
111	US 202 NB & Mt Lebanon Rd	Synchro	C	22.6	A	NA	C	NA	Synchro	F	96.8	B	NA	F	NA	Synchro	C	23.2	B	NA	C	NA	Synchro	F	83.4	F	NA	F	NA
11	US 202 SB & Mt Lebanon Rd	Synchro	C	32.3	D	NA	E	C	Synchro	D	46.6	D	NA	C	D	Synchro	C	32.9	E	NA	F	C	Synchro	D	41.3	F	NA	C	C
12	US 202 & Prospect Ave	Synchro	B	18.2	D	D	B	C	Synchro	E	60.1	E	D	E	D	Synchro	B	11.7	C	D	A	B	Synchro	B	16.8	D	D	B	B
13	US 202 & Whitby Rd/Florence Ave	HCM 6	D	35.0	F	E	B	C	HCM 6	D	40.3	F	D	C	C	HCM 6	C	33.1	F	E	C	C	HCM 6	D	39.4	F	D	C	C
14	US 202 & Concord Ave	HCM 6	A	4.5	E	E	A	A	HCM 6	A	5.2	E	E	A	A	HCM 6	A	4.3	E	E	A	A	HCM 6	A	5.1	E	E	A	A
15	US 202 & Woodrow Ave	HCM 6	A	1.0	E	E	A	A	HCM 6	A	1.0	E	E	A	A	HCM 6	A	1.0	E	E	A	A	HCM 6	A	1.0	E	E	A	A
16	US 202 & Sharpley Rd	Synchro	B	12.9	E	NA	A	A	Synchro	C	26.0	D	NA	D	B	Synchro	B	13.4	E	NA	B	B	Synchro	C	23.1	D	NA	C	A
17	US 202 & Fairfax Blvd	Synchro	D	40.8	D	F	C	C	Synchro	E	57.6	D	F	E	C	Synchro	D	43.7	D	F	B	D	Synchro	D	40.2	D	F	E	B
18	US 202 & AZ Ent/Fairfax Shopping Ctr	Synchro	F	89.4	E	F	C	F	Synchro	E	58.3	E	E	D	E	Synchro	E	75.0	E	E	B	F	Synchro	D	43.9	E	F	C	E
19	US 202 & Powder Mill Rd/Murphy Rd	HCM 6	F	131.1	E	F	C	C	HCM 6	F	111.4	E	F	F	D	HCM 6	F	136.6	E	F	C	C	HCM 6	F	111.2	E	F	F	D
20	US 202 & Independence Mall	HCM 6	A	6.8	NA	E	A	B	HCM 6	A	8.2	NA	E	A	B	HCM 6	A	6.8	NA	E	A	B	HCM 6	A	8.2	NA	E	A	B
21	US 202 & Foulk Rd	Synchro	C	22.3	D	E	C	A	Synchro	C	20.2	D	E	B	B	Synchro	C	27.7	D	E	C	C	Synchro	B	15.3	D	E	B	A
22	US 202 & Augustine Cutoff	Synchro	B	11.9	A	NA	E	B	Synchro	A	8.0	A	NA	E	A	Synchro	A	7.5	A	NA	E	A	Synchro	B	11.0	A	NA	E	B

Int #	Intersection Name	Enhanced Ped/Bike Network													Multimodal Improvements													
		AM							PM						AM							PM						
		Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB
1	US 202 & Brandywine Pkwy	HCM 6	B	11.6	NA	D	A	B	HCM 6	B	14.4	NA	D	A	C	HCM 6	B	11.6	NA	D	A	B	HCM 6	B	14.4	NA	D	A	C
2	US 202 & Chubb Ent	Synchro	A	4.8	D	NA	A	A	Synchro	A	6.7	E	NA	A	A	Synchro	A	4.7	D	NA	A	A	Synchro	A	7.6	E	NA	A	A
3	US 202 & SR 92 Naamans Rd	HCM 6	C	32.8	E	E	A	C	HCM 6	E	57.4	F	E	D	D	HCM 6	D	48.9	E	D	B	E	HCM 6	E	70.0	E	F	D	F
4	US 202 & Concord Mall North	Synchro	B	10.3	D	C	B	A	Synchro	B	17.8	F	C	A	C	Synchro	A	9.0	D	C	B	A	Synchro	B	17.8	F	C	A	C
5	US 202 & Concord Mall South	Synchro	A	3.0	NA	E	A	A	Synchro	A	5.8	NA	E	A	B	Synchro	A	2.8	NA	E	A	A	Synchro	A	5.8	NA	E	A	B
6	US 202 & Rocky Run Pkwy/Widener U	HCM 6	C	28.8	E	F	C	A	HCM 6	C	30.3	E	F	D	A	HCM 6	C	28.8	E	F	C	A	HCM 6	C	29.5	E	F	D	A
7	US 202 & Righter Pkwy/Concord Square	Synchro	C	28.2	B	C	C	C	Synchro	D	43.5	D	D	D	D	Synchro	B	18.1	E	E	B	B	Synchro	D	42.5	E	F	D	C
8	US 202 SB & NB U-turn	Synchro	B	14.2	NA	E	NA	B	Synchro	D	46.5	NA	E	NA	D														
91	US 202 NB & Silverside Rd	Synchro	C	23.7	C	D	B	NA	Synchro	E	68.1	F	F	E	NA	Synchro	C	30.2	F	D	B	NA	Synchro	E	71.0	F	D	E	NA
9	US 202 SB & Garden of Eden Rd	Synchro	B	19.3	D	A	NA	B	Synchro	B	19.4	C	D	NA	B	Synchro	E	58.3	F	D	NA	D	Synchro	E	66.6	E	F	NA	D
101	US 202 NB & Brandywine Blvd	Synchro	A	4.4	NA	E	A	NA	Synchro	C	23.8	NA	F	C	NA	Synchro	A	4.5	NA	E	A	NA	Synchro	D	51.6	NA	F	D	NA
10	US 202 SB & Brandywine Blvd	Synchro	A	4.4	NA	C	NA	A	Synchro	A	5.3	NA	B	NA	A	Synchro	A	7.1	NA	C	NA	A	Synchro	A	8.7	NA	B	NA	A
111	US 202 NB & Mt Lebanon Rd	Synchro	C	22.8	B	NA	C	NA	Synchro	F	84.3	F	NA	F	NA	Synchro	B	12.8	C	NA	B	NA	Synchro	E	71.4	F	NA	E	NA
11	US 202 SB & Mt Lebanon Rd	Synchro	C	30.3	E	NA	F	C	Synchro	D	47.5	F	NA	C	C	Synchro	B	19.4	D	F	NA	NA	Synchro	D	53.3	D	F	NA	NA
12	US 202 & Prospect Ave	Synchro	B	11.3	C	D	A	B	Synchro	B	15.4	D	D	B	B	Synchro	B	11.3	C	D	A	B	Synchro	B	15.4	D	D	B	B
13	US 202 & Whitby Rd/Florence Ave	HCM 6	C	31.9	F	E	C	C	HCM 6	D	37.8	F	D	C	C	HCM 6	E	65.3	F	E	C	E	HCM 6	E	58.8	F	E	D	D
14	US 202 & Concord Ave	HCM 6	A	4.3	E	E	A	A	HCM 6	A	5.1	E	E	A	A	HCM 6	A	4.2	E	E	A	A	HCM 6	A	5.1	E	E	A	A
15	US 202 & Woodrow Ave	HCM 6	A	1.0	E	E	A	A	HCM 6	A	1.0	E	E	A	A	HCM 6	A	1.0	E	E	A	A	HCM 6	A	1.0	E	E	A	A
16	US 202 & Sharpley Rd	Synchro	B	13.0	E	NA	B	A	Synchro	B	19.9	D	NA	C	A	Synchro	B	12.9	E	NA	A	B	Synchro	C	20.2	D	NA	C	A
17	US 202 & Fairfax Blvd	Synchro	D	43.4	C	F	B	D	Synchro	D	36.3	D	F	D	B	Synchro	D	42.8	C	F	B	D	Synchro	D	36.3	D	F	D	B
18	US 202 & AZ Ent/Fairfax Shopping Ctr	Synchro	E	69.3	E	E	B	F	Synchro	D	37.7	D	F	C	D	Synchro	E	69.8	E	E	B	F	Synchro	D	44.6	D	F	D	D
19	US 202 & Powder Mill Rd/Murphy Rd	HCM 6	F	133.2	E	F	C	C	HCM 6	F	103.4	E	F	F	D	HCM 6	D	47.0	E	E	D	C	HCM 6	E	75.2	E	E	F	D
20	US 202 & Independence Mall	HCM 6	A	6.7	NA	E	A	B	HCM 6	A	8.0	NA	E	A	B	HCM 6	A	6.7	NA	E	A	B	HCM 6	A	8.0	NA	E	A	B
21	US 202 & Foulk Rd	Synchro	C	26.9	D	E	C	C	Synchro	B	16.2	D	E	B	A	Synchro	C	30.4	D	E	C	C	Synchro	B	16.2	D	E	B	A
22	US 202 & Augustine Cutoff	Synchro	A	7.5	A	NA	E	A	Synchro	B	11.9	A	NA	E	B	Synchro	A	6.9	A	NA	E	A	Synchro	B	11.2	A	NA	E	B

Intersection Level of Service Results - 2050 Proposed Zoning - High Development

Int #	Intersection Name	Do Nothing													Enhanced Vehicle Network													
		AM							PM						AM							PM						
		Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB
1	US 202 & Brandywine Pkwy	HCM 6	C	26.1	*NA*	D	C	B	HCM 6	C	24.6	*NA*	D	C	C	HCM 6	B	17.6	*NA*	D	B	B	HCM 6	C	26.6	*NA*	D	C	C
2	US 202 & Chubb Ent	Synchro	A	1.5	D	*NA*	A	A	Synchro	A	8.5	**E**	*NA*	A	A	Synchro	A	1.7	D	*NA*	A	A	Synchro	A	7.9	**E**	*NA*	A	A
3	US 202 & SR 92 Naamans Rd	HCM 6	D	37.2	**E**	**E**	B	D	HCM 6	**E**	72.6	**F**	**F**	**E**	**E**	HCM 6	D	35.6	**E**	**E**	A	D	HCM 6	**E**	62.1	**F**	**E**	D	D
4	US 202 & Concord Mall North	Synchro	B	10.8	D	D	B	A	Synchro	B	19.0	**F**	C	B	B	Synchro	B	11.2	D	B	B	A	Synchro	C	21.4	**F**	C	B	C
5	US 202 & Concord Mall South	Synchro	A	8.3	*NA*	**F**	A	A	Synchro	B	11.4	*NA*	**F**	A	C	Synchro	A	4.1	*NA*	**F**	A	A	Synchro	A	7.7	*NA*	**F**	A	A
6	US 202 & Rocky Run Pkwy/Widener U	HCM 6	D	46.3	**E**	**F**	C	B	HCM 6	D	44.6	**E**	**F**	D	A	HCM 6	D	45.5	**E**	**F**	C	B	HCM 6	D	48.0	**E**	**F**	**E**	B
7	US 202 & Righter Pkwy/Concord Square	Synchro	C	28.0	B	C	C	C	Synchro	**E**	70.2	D	D	**F**	**E**	Synchro	C	28.9	B	C	C	C	Synchro	**E**	76.6	D	D	**E**	**F**
8	US 202 SB & NB U-turn	Synchro	B	15.8	*NA*	**E**	*NA*	B	Synchro	D	52.1	*NA*	**E**	*NA*	D	Synchro	B	15.8	*NA*	**E**	*NA*	B	Synchro	**E**	75.5	*NA*	**E**	*NA*	**E**
91	US 202 NB & Silverside Rd	Synchro	D	44.7	C	**E**	D	*NA*	Synchro	**F**	91.5	**F**	**F**	*NA*		Synchro	C	28.2	C	D	B	*NA*	Synchro	**E**	77.2	**F**	**F**	**E**	*NA*
9	US 202 SB & Garden of Eden Rd	Synchro	**E**	59.1	**E**	B	*NA*	**E**	Synchro	C	25.5	**F**	D	*NA*	B	Synchro	C	22.8	D	A	*NA*	C	Synchro	C	24.1	D	D	*NA*	B
101	US 202 NB & Brandywine Blvd	Synchro	A	5.0	*NA*	**E**	A	*NA*	Synchro	**E**	59.3	*NA*	**F**	**E**	*NA*	Synchro	A	3.6	*NA*	**E**	A	*NA*	Synchro	**E**	70.8	*NA*	**F**	D	*NA*
10	US 202 SB & Brandywine Blvd	Synchro	A	2.7	*NA*	C	*NA*	A	Synchro	A	5.0	*NA*	C	*NA*	A	Synchro	A	2.8	*NA*	C	*NA*	A	Synchro	B	15.1	*NA*	B	*NA*	B
111	US 202 NB & Mt Lebanon Rd	Synchro	C	24.5	A	*NA*	C	*NA*	Synchro	**F**	118.9	B	*NA*	**F**	*NA*	Synchro	C	24.8	B	*NA*	C	*NA*	Synchro	**F**	93.0	**F**	*NA*	**F**	*NA*
11	US 202 SB & Mt Lebanon Rd	Synchro	D	43.0	D	*NA*	**E**	D	Synchro	**E**	62.5	D	*NA*	C	**E**	Synchro	D	38.5	**E**	*NA*	**F**	C	Synchro	D	48.9	**F**	*NA*	C	C
12	US 202 & Prospect Ave	Synchro	C	30.0	D	D	B	D	Synchro	**E**	69.5	**F**	D	**E**	**E**	Synchro	B	13.2	D	D	A	B	Synchro	C	31.2	D	D	D	C
13	US 202 & Whitby Rd/Florence Ave	HCM 6	D	37.2	**F**	**E**	C	C	HCM 6	D	44.5	**F**	D	D	C	HCM 6	D	36.1	**F**	**E**	C	C	HCM 6	D	44.1	**F**	D	C	C
14	US 202 & Concord Ave	HCM 6	A	4.7	**E**	**E**	A	A	HCM 6	A	5.5	**E**	**E**	A	A	HCM 6	A	4.5	**E**	**E**	A	A	HCM 6	A	5.4	**E**	**E**	A	A
15	US 202 & Woodrow Ave	HCM 6	A	1.0	**E**	**E**	A	A	HCM 6	A	1.1	**E**	**E**	A	A	HCM 6	A	1.0	**E**	**E**	A	A	HCM 6	A	1.1	**E**	**E**	A	A
16	US 202 & Sharpley Rd	Synchro	B	13.9	**E**	*NA*	A	B	Synchro	C	32.2	D	*NA*	D	B	Synchro	B	13.9	**E**	*NA*	A	B	Synchro	C	27.6	D	*NA*	D	A
17	US 202 & Fairfax Blvd	Synchro	D	52.4	D	**F**	C	D	Synchro	**E**	60.3	D	**F**	**E**	C	Synchro	D	44.5	D	**F**	B	D	Synchro	D	46.3	D	**F**	**E**	C
18	US 202 & AZ Ent/Fairfax Shopping Ctr	Synchro	**F**	94.3	**E**	**F**	D	**F**	Synchro	**E**	66.8	**E**	**F**	**E**	**E**	Synchro	**E**	79.6	**E**	**E**	B	**F**	Synchro	D	48.5	**E**	**F**	C	**E**
19	US 202 & Powder Mill Rd/Murphy Rd	HCM 6	**F**	142.1	**E**	**F**	C	C	HCM 6	**F**	126.1	**E**	**F**	**F**	D	HCM 6	**F**	147.4	**E**	**F**	C	C	HCM 6	**F**	126.8	**E**	**F**	**F**	D
20	US 202 & Independence Mall	HCM 6	A	7.0	*NA*	**E**	A	B	HCM 6	A	8.6	*NA*	**E**	A	B	HCM 6	A	7.0	*NA*	**E**	A	B	HCM 6	A	8.6	*NA*	**E**	A	B
21	US 202 & Foulk Rd	Synchro	C	22.6	D	**E**	C	A	Synchro	C	20.6	D	**E**	B	B	Synchro	C	28.0	D	**E**	C	C	Synchro	B	15.5	D	**E**	B	A
22	US 202 & Augustine Cutoff	Synchro	B	12.1	A	*NA*	**E**	B	Synchro	A	8.6	A	*NA*	**E**	A	Synchro	A	7.7	A	*NA*	**E**	A	Synchro	B	11.5	A	*NA*	**E**	B

Int #	Intersection Name	Enhanced Ped/Bike Network													Multimodal Improvements													
		AM							PM						AM							PM						
		Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB	Method	Int. LOS	Delay (s)	EB	WB	NB	SB
1	US 202 & Brandywine Pkwy	HCM 6	B	12.5	*NA*	D	A	B	HCM 6	ter	15.6	*NA*	D	A	C	HCM 6	B	12.5	*NA*	D	A	B	HCM 6	B	15.6	*NA*	D	A	C
2	US 202 & Chubb Ent	Synchro	A	5.0	D	*NA*	A	A	Synchro	A	7.1	**E**	*NA*	A	A	Synchro	A	5.0	D	*NA*	A	A	Synchro	A	8.0	**E**	*NA*	A	A
3	US 202 & SR 92 Naamans Rd	HCM 6	C	34.2	**E**	**E**	A	C	HCM 6	**E**	62.3	**F**	**E**	**E**	D	HCM 6	D	51.9	**E**	**E**	B	**E**	HCM 6	**E**	78.3	**E**	**F**	**E**	**F**
4	US 202 & Concord Mall North	Synchro	B	10.9	D	B	B	A	Synchro	B	19.0	**F**	C	A	C	Synchro	A	9.4	D	B	B	A	Synchro	B	19.0	**F**	C	A	C
5	US 202 & Concord Mall South	Synchro	A	3.7	*NA*	**F**	A	A	Synchro	A	6.7	*NA*	**E**	A	B	Synchro	A	3.5	*NA*	**F**	A	A	Synchro	A	6.7	*NA*	**E**	A	B
6	US 202 & Rocky Run Pkwy/Widener U	HCM 6	D	38.1	**E**	**F**	C	A	HCM 6	D	36.8	**E**	**F**	D	B	HCM 6	D	38.1	**E**	**F**	C	A	HCM 6	D	36.6	**E**	**F**	D	B
7	US 202 & Righter Pkwy/Concord Square	Synchro	C	28.9	B	C	C	C	Synchro	**E**	66.6	D	D	D	**F**	Synchro	B	18.9	**E**	**E**	B	C	Synchro	D	47.9	**E**	**F**	D	D
8	US 202 SB & NB U-turn	Synchro	B	15.0	*NA*	**E**	*NA*	B	Synchro	**E**	67.3	*NA*	**E**	*NA*	**E**														
91	US 202 NB & Silverside Rd	Synchro	C	25.2	C	D	B	*NA*	Synchro	**E**	69.8	**F**	**F**	**E**	*NA*	Synchro	C	30.4	**F**	D	B	*NA*	Synchro	**E**	80.0	**F**	**F**	**E**	*NA*
9	US 202 SB & Garden of Eden Rd	Synchro	C	20.5	D	A	*NA*	C	Synchro	C	21.0	C	D	*NA*	B	Synchro	**E**	55.6	**F**	**E**	*NA*	D	Synchro	**E**	75.7	**E**	**F**	*NA*	**E**
101	US 202 NB & Brandywine Blvd	Synchro	A	4.4	*NA*	**E**	A	*NA*	Synchro	D	54.4	*NA*	**F**	D	*NA*	Synchro	A	4.6	*NA*	**E**	A	*NA*	Synchro	D	52.3	*NA*	**F**	D	*NA*
10	US 202 SB & Brandywine Blvd	Synchro	A	4.3	*NA*	C	*NA*	A	Synchro	A	5.3	*NA*	B	*NA*	A	Synchro	A	9.3	*NA*	D	*NA*	A	Synchro	A	2.5	*NA*	B	*NA*	A
111	US 202 NB & Mt Lebanon Rd	Synchro	C	24.1	B	*NA*	C	*NA*	Synchro	**F**	83.6	**F**	*NA*	**F**	*NA*	Synchro	B	13.2	C	*NA*	B	*NA*	Synchro	**E**	72.3	**F**	*NA*	**E**	*NA*
11	US 202 SB & Mt Lebanon Rd	Synchro	C	33.3	**E**	*NA*	**F**	C	Synchro	D	52.6	**F**	*NA*	C	C	Synchro	C	21.9	D	**F**	*NA*	*NA*	Synchro	D	54.5	**E**	**F**	*NA*	*NA*
12	US 202 & Prospect Ave	Synchro	B	12.7	D	D	A	B	Synchro	B	20.0	D	D	B	B	Synchro	B	12.7	D	D	A	B	Synchro	B	20.0	D	D	B	B
13	US 202 & Whitby Rd/Florence Ave	HCM 6	C	34.2	**F**	**E**	C	C	HCM 6	D	41.7	**F**	D	C	C	HCM 6	**E**	70.8	**F**	**E**	D	**E**	HCM 6	**E**	66.3	**F**	**E**	D	**E**
14	US 202 & Concord Ave	HCM 6	A	4.4	**E**	**E**	A	A	HCM 6	A	5.4	**E**	**E**	A	A	HCM 6	A	4.3	**E**	**E**	A	A	HCM 6	A	5.4	**E**	**E**	A	A
15	US 202 & Woodrow Ave	HCM 6	A	1.0	**E**	**E**	A	A	HCM 6	A	1.0	**E**	**E**	A	A	HCM 6	A	1.0	**E**	**E**	A	A	HCM 6	B	12.0	**E**	**E**	C	A
16	US 202 & Sharpley Rd	Synchro	B	13.4	**E**	*NA*	A	B	Synchro	C	22.8	D	*NA*	C	A	Synchro	B	13.3	**E**	*NA*	A	B	Synchro	C	23.1	D	*NA*	C	A
17	US 202 & Fairfax Blvd	Synchro	D	44.0	D	**F**	B	D	Synchro	D	41.5	D	**F**	D	B	Synchro	D	43.3	D	**F**	B	D	Synchro	D	41.5	D	**F**	D	B
18	US 202 & AZ Ent/Fairfax Shopping Ctr	Synchro	**E**	73.3	**E**	**E**	B	**F**	Synchro	D	41.4	D	**F**	C	**E**	Synchro	**E**	74.1	**E**	**E**	C	**F**	Synchro	**E**	56.2	D	**F**	D	**E**
19	US 202 & Powder Mill Rd/Murphy Rd	HCM 6	**F**	142.3	**E**	**F**	C	C	HCM 6	**F**	116.8	**E**	**F**	**F**	D	HCM 6	D	48.7	**E**	**E**	D	D	HCM 6	**F**	85.7	**E**	**E**	**F**	**E**
20	US 202 & Independence Mall	HCM 6	A	6.8	*NA*	**E**	A	B	HCM 6	A	8.2	*NA*	**E**	A	B	HCM 6	A	6.8	*NA*	**E**	A	B	HCM 6	A	8.2	*NA*	**E**	A	B
21	US 202 & Foulk Rd	Synchro	C	27.2	D	**E**	C	C	Synchro	B	16.5	D	**E**	B	A	Synchro	C	30.1	D	**E**	C	C	Synchro	B	19.9	D	**E**	B	B
22	US 202 & Augustine Cutoff	Synchro	A	7.6	A	*NA*	**E**	A	Synchro	B	12.3	A	*NA*	**E**	B	Synchro	A	7.0	A	*NA*	**E**	A	Synchro	B	15.1	A	*NA*	**E**	B