

## 3.0 ACCESS CONTROL PLAN - HARMONY ROAD (SH68)

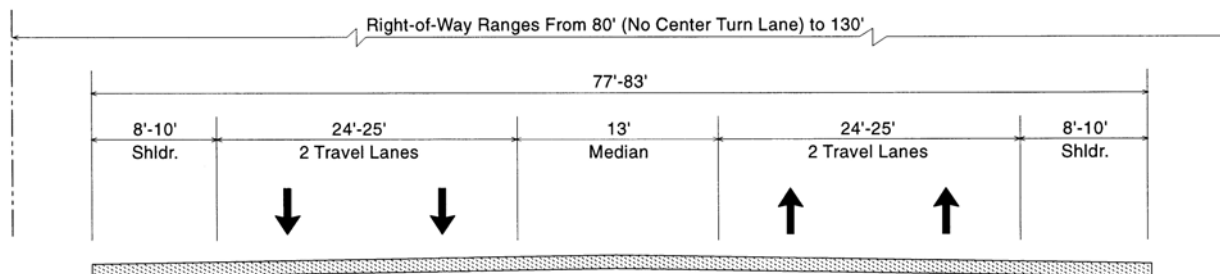
### 3.1 Existing Conditions

#### Roadway Physical Characteristics

##### Typical Section

The existing typical cross-section for SH68 is shown on Figure 3-1 and is comprised of four travel lanes, a 19'+ depressed grass median, 10' bikelanes, and an 80' set back area which is landscaped and includes an 8' pedestrian path. In most areas, there is not any curb or gutter. The dimensions are relatively constant throughout the corridor with the most common dimensions being:

Travel Lanes:	12 feet - 13 feet
Outside Shoulder/Bikeline:	8 feet - 10 feet
Center, Depressed Median:	19 feet
Right-of-Way:	varies from 80' to 130'



**Figure 3.1: Existing Typical Harmony Road/SH68 Cross-Section**

The study area is an approximate 4.5-mile segment of SH68 from South College Avenue to I-25. The City classifies SH68 as a Major Arterial street which typically includes such characteristics as three travel lanes in each direction, a 19 foot raised and landscaped median, 10 foot bike lanes, two 10 foot parkway buffers and 7 foot sidewalks. The SH68 corridor uses a modified cross-section from Boardwalk to I-25, however, which places an 8 foot pedestrian trail within an 80 foot buffer area outside of the roadway.

Harmony Road is not currently developed to this extent, however. It is typically a divided four-lane highway with left and right turn deceleration lanes at public road intersections and major access points. The eastbound and westbound directions of Harmony Road are separated by a raised median between South College Avenue and JFK Parkway, while depressed median exists between Boardwalk Drive and I-25. The median area has been paved between Boardwalk Drive and JFK Parkway, and just to the east and west of the at-grade railroad crossing located to the west of Timberline Road. Sidewalks are not continuous when provided; however, along most of the corridor, and 10' or 12' shoulders offer emergency parking and bike lanes.

## Functional Classification

Roadway segments are classified as a certain type of roadway based on the function that the roadway provides. Certain roadways are meant to provide for travel through an area and, therefore, mobility is the primary purpose. The primary purpose of other roadways, however, is to provide access to individual properties. Following is a description of the typical roadway functional classifications found in most communities:

**Arterial** roadways primarily provide mobility between two points. They can be two to six lanes wide, typically carrying significant traffic volumes at higher speeds and for longer distances. Access to abutting properties is a secondary function. An arterial functional classification is also typically divided into two sub-categories, major and minor arterials. As these classifications infer, roadway, laneage and right-of-way requirements and traffic volumes are typically greater for the major arterial classification.

A **Collector** roadway serves both access and mobility functions. A collector street can be either two or four lanes wide with speeds and traffic volumes less than an arterial street but greater than a local street. Major and minor collectors also differ in the laneage and right-of-way requirements, and traffic volume levels as their classifications imply.

**Local** roadways serve primarily as a means of access to adjacent land uses, whether residential, business or community facilities. They are typically low speed, two or three lanes wide (with a center left turn lane) and carry relatively low traffic volumes.

The City of Fort Collins has classified SH68 as an Major Arterial Street. As adjoining parcels re-develop, they will be required to provide sufficient right-of-way to construct the Major Arterial Street cross-section. The cross-section features include:

- 3 – 12' foot travel lanes in each direction
- 1 – 10' bike lane in each direction
- A 19' raised, landscaped median (7 foot median with a 12 foot left turn lane at major intersections)
- 141' right-of-way (minimum), plus an 80' set back on each side for landscaping and 8' meandering pedestrian path for the section of SH68 between Boardwalk and I-25.

## Access Code Category

In August of 1998, the Colorado Department of Transportation adopted a revised State Highway Access Code. The revised Access Code reevaluated the number of access categories and their respective naming convention, and established new guidelines for access along state highways. The revised access categories are defined in Table 3-1. The purpose of the Access Code is to “provide procedures and standards to aid in the management of the highway system” and to “protect the public health, safety and welfare, to maintain smooth traffic flow, and to protect the functional level of state highways while considering state, regional and local transportation needs and interests.”

**Table 3-1**  
**Access Categories**

<b>F-W</b> Interstate System, Freeway Facilities	
<b>E-X</b> Expressway, Major Bypass	
<b>Rural</b>	<b>Non-Rural</b>
<b>R-A</b> Regional Highway	<b>NR-A</b> Regional Highway
<b>R-B</b> Rural Highway	<b>NR-B</b> Arterial
	<b>NR-C</b> Arterial
<b>F-R</b> Frontage Roads (both urban and rural)	

The access category that is assigned to SH68 is NR-A, Non-Rural Principal Arterial. Some of the access category standards include:

Access Granting Criteria:	“...one access shall be granted per parcel, if reasonable access cannot be obtained from the local street or road system.” (Section 3.10.(2))
Desirable Signal Spacing:	One-half mile intersection spacing for all public roadways and other accesses that will be full movement, or have the potential for signalization with good signal progression of 35% efficiency or better, or existing signal progression is not degraded (Section 3.10.(3)).
Additional Access:	“Additional right-turn-only access shall be allowed where required auxiliary lanes can be provided, would relieve an identified congestion condition on the local street or road system, would not be detrimental to the safety and operations of the highway, ... and the additional .”(Section 3.10(6))

The goal of the Access Control Plan is to provide adequate and reasonable access for all properties; however, adequate spacing of access points should be introduced to relieve congestion and reduce the number of conflict points along the corridor.

### **Railroad Crossings**

Currently, there is one at-grade railroad crossing along this section of SH68. This crossing is for the Union Pacific Railroad and is located between McMurry Avenue and Timberline Road.

### **Posted Speeds**

Harmony Road has four separate speed limit regulations along the South College Avenue to I-25 corridor.

South College Avenue to Boardwalk Drive	45 mph
Boardwalk Drive to Timberline Road	50 mph
Timberline Road to LCR 7	55 mph
LCR 7 to I-25	45 mph

## 3.2 *Inventory of Access Points*

The access points within the corridor are quite diverse. At one extreme are lightly traveled private driveways, while at the opposite end are access points serving shopping centers with several business establishments. Most of the access points along the corridor are public streets or private access for the myriad of businesses. A few private driveways exist serving only a single family dwelling intermixed with the more abundant commercial accesses. Some access points are not clearly defined, however. A few properties have an “open” access along the property frontage allowing for inbound and outbound movements at any point along the frontage. Following is a summary of the significant access types along the corridor.

- Public Road Signalized Intersection (PRS) - Public road signalized intersections are at-grade, full movement public road intersections with a traffic signal. Signalized public roads include US287, ramps for I-25 and several city streets. The PRS accesses along SH68, from west to east, are:
  - US 287 – South College Avenue
  - John F. Kennedy Parkway/Hogan Drive
  - Boardwalk Drive
  - Lemay Avenue
  - McMurry Avenue
  - Timberline Road
  - Corbett Drive
  - Zeigler Road
  - Transportation Transfer Center/Frontage Road
  - I-25 ramps
- Public Road Unsignalized Intersection (PRU) - This type of highway access is a full or partial movement, at-grade, stop-controlled intersection. The PRU accesses along SH68, from west to east, are:
  - Stover Street (full movement, north side only)
  - Wheaton Drive ( $\frac{3}{4}$  access, north and south sides)
  - Innovation Drive (RIRO, north side only)
  - Gifford Court (RIRO, south side only)
  - Cambridge Avenue (full, south side only)
  - Cinquefoil Lane (RIRO, south side only)
  - Strauss Cabin Road (full)
- Driveway Access (DA) - Driveway accesses are full or partial movement highway accesses serving numerous types of private properties. Along SH68, some driveways serve major traffic generators such as shopping centers and office developments. These driveways typically have acceleration/deceleration lanes. Examples of major driveway accesses are the two full movement accesses for Hewlett-Packard, the  $\frac{3}{4}$  access serving the Harmony Center, and the RIRO access serving the Sam’s Club shopping center. A driveway access can be a drop curb or other highway access that serves a business such as a gas station, restaurant, or a retail area; or an access serving a single family home along the highway. There are a total of 39 driveway accesses along SH68.

Based on the above classifications of access points, accesses along the corridor are approximately distributed as follows:

- 11 public road intersections with signals (19.3%)
- 7 unsignalized public road intersections (12.3%)
- 39 driveway accesses (68.4%)

A detailed listing of each access point along SH68 between US287/South College Avenue and I-25 is included in Appendix A.

### **3.3 Existing Traffic Conditions**

#### **Traffic Volumes**

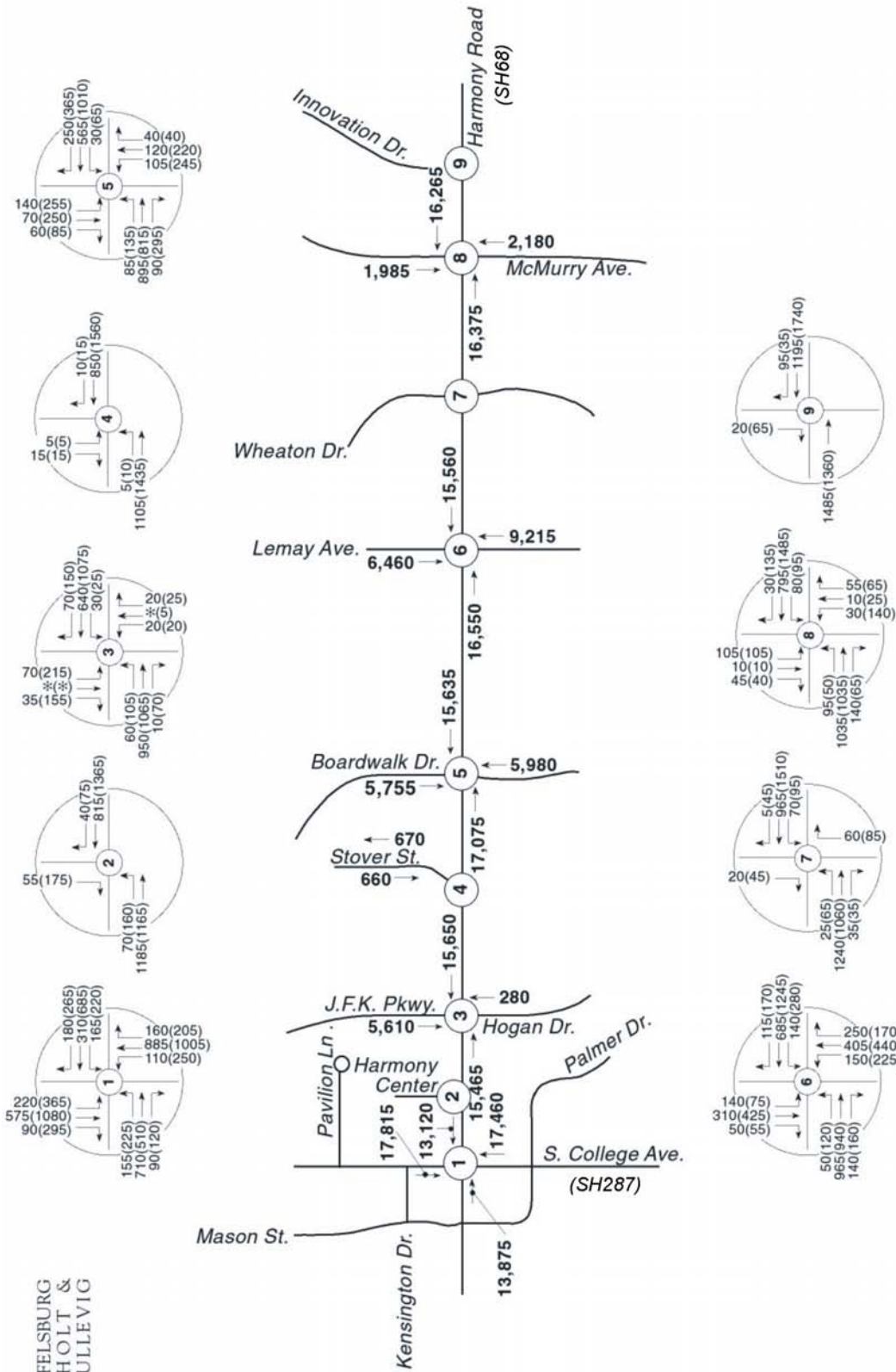
The City of Fort Collins provided traffic volume data, including vehicle turning movements and Average Daily Traffic (ADT). Figures 3.2 and 3.3 illustrate the ADT, and AM and PM peak hour turning movements along the corridor.

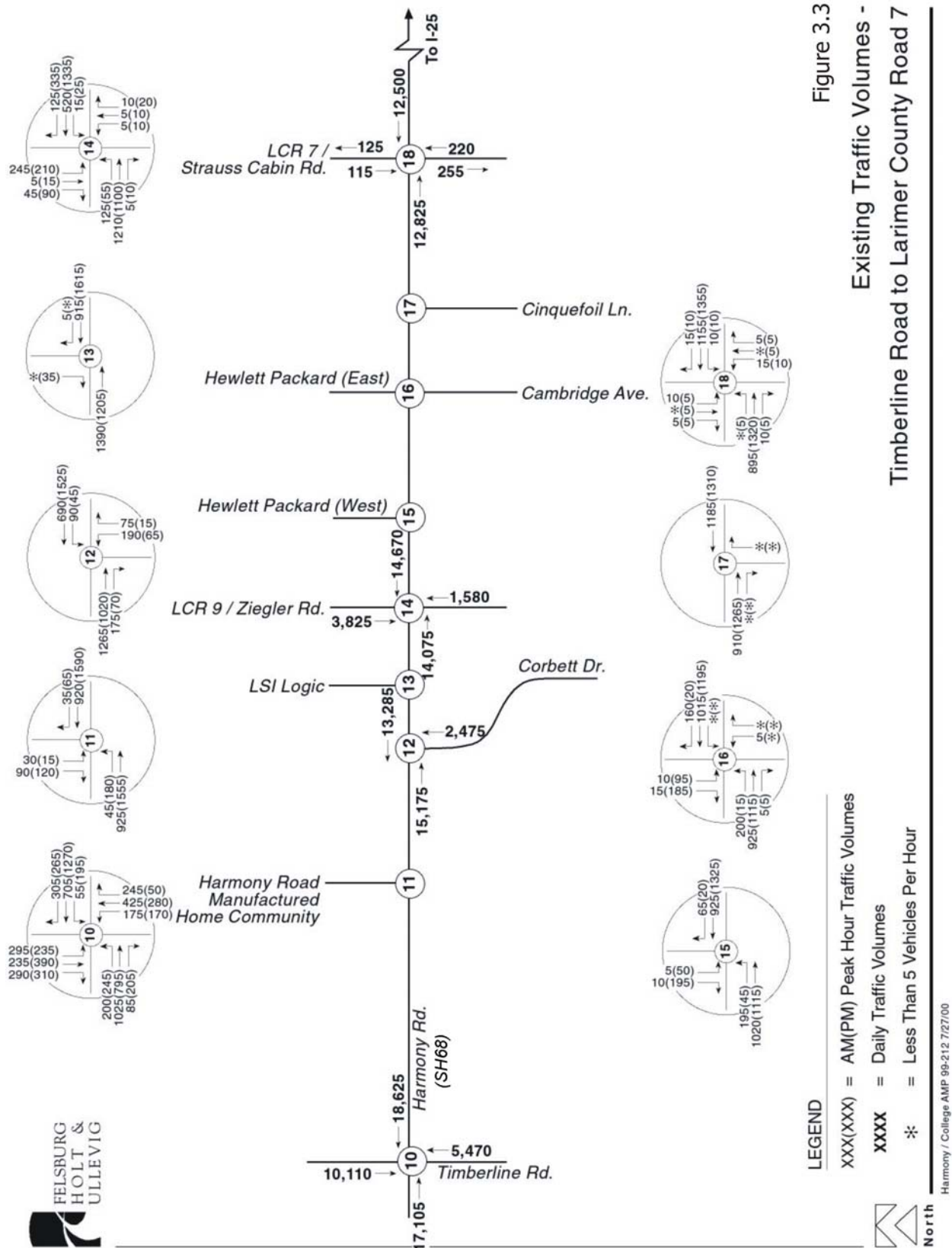
As can be seen on Figures 3.2 and 3.3, ADT volumes in the westbound direction range from a low of 12,500 vehicles per day (vpd) approaching LCR 7 to a high of 18,625 vpd approaching Timberline Road. In the eastbound direction, ADT ranges from a high of 17,105 vpd approaching Timberline Road to a low of 12,825 vpd approaching LCR 7. Peak hour traffic volumes are generally higher in the eastbound direction during the AM peak hour and westbound during the PM peak hour.

Existing left and right turn traffic volumes that are relatively high when compared to the rest of the corridor, thereby indicating the possible need for a second left turn lane or an exclusive right turn lane. These locations include:

- Southbound left turn at South College Avenue (365 vehicles per hour [vph] – PM)
- Southbound right turn at South College Avenue (295 – PM)
- Westbound right turn at South College Avenue (265 vph - PM)
- Southbound left turn at Boardwalk Drive (255 vph - PM)
- Northbound left turn at Boardwalk Drive (245 vph - PM)
- Westbound right turn at Boardwalk Drive (250 vph - AM; 365 vph – PM)
- Eastbound right turn at Boardwalk Drive (295 – PM)
- Westbound left turn at Lemay Avenue (280 vph - PM)
- Northbound right turn at Lemay Avenue (250 – AM)
- Southbound right turn at Timberline Road (290 vph - AM, 310 vph - PM)
- Southbound left turn at Timberline Road (295 vph - AM)
- Eastbound left turn at Timberline Road (245 vph - PM)
- Northbound right turn at Timberline Road (245 vph - AM)
- Southbound left turn at Ziegler Road/LCR 9 (245 vph - AM)
- Westbound right turn at Ziegler Road/LCR 9 (335 vph – PM)

A left turn or right turn volume of approximately 300 vph serves as a guidepost for the installation of a separate right turn lane or second left turn lane.





## Operational Conditions

The detailed traffic analysis for this corridor is included in the Harmony Road (SH68) Access Control Plan by Felsburg Holt & Ullevig. Harmony Road has numerous access points between South College Ave/US 287 and I-25. There are currently 57 accesses along SH68, including the public street intersections.

The AM and PM peak hour turning movement volumes were used to estimate the traffic flow characteristics of each signalized intersection. Analysis methods documented in the 1994 Highway Capacity Manual (TRB Special Report No. 209), updated 1997, were used to establish a Level of Service (LOS) for each signalized intersection, a qualitative assessment of the traffic flow characteristics described by a letter designation ranging from LOS A (essentially uninterrupted flow) to LOS F (a breakdown of traffic flow with excessive congestion and delay). LOS D or better is generally considered to be acceptable for peak period conditions in urban areas and is used by the City of Fort Collins as a guidepost for evaluating the operation of an intersection (City of Fort Collins Multimodal Level of Service Manual). LOS D is also the accepted guidepost for CDOT.

At stop-controlled intersections, LOS F results when more than 50 seconds of average stopped delay occurs. Due to high levels of through traffic on SH68, it is not uncommon for left turn movements from the stop-controlled approach to operate at LOS F even if left turns are low and do not meet MUTCD criteria for signalization.

Existing lane geometry and signal timing information was used to estimate peak hour LOS for each signalized public street intersection. The results of the analyses are shown on Figures 3.4 and 3.5, and include the existing intersection geometry. As can be seen on these figures, LOS C or better is achieved at most signalized intersections during both peak hours. Exceptions are at Lemay Avenue during the PM peak hour and at Timberline Road during the AM and PM peak hours.



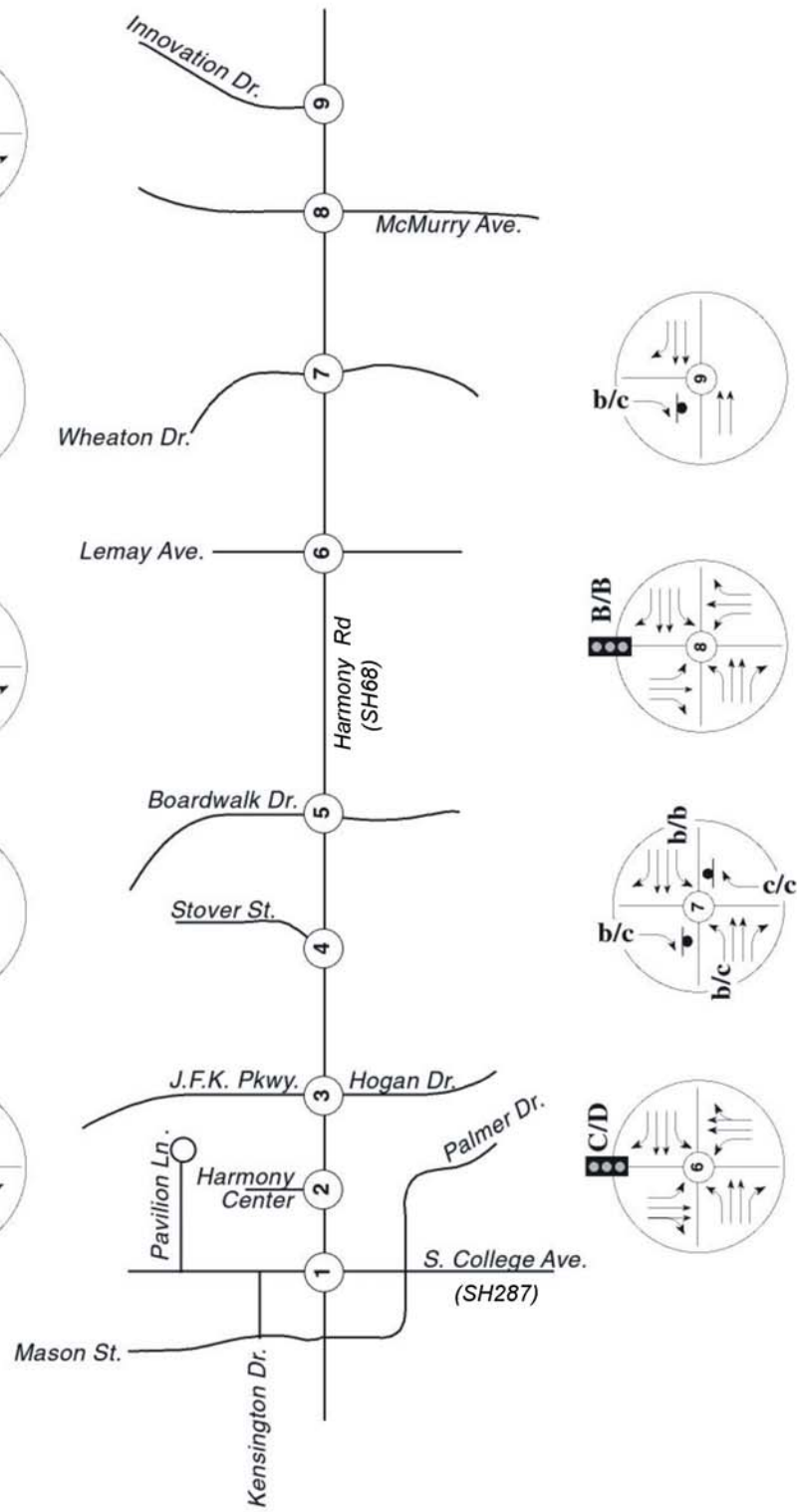


Figure 3.4  
Existing Intersection Geometry and Levels of Service -  
South College Avenue to Innovation Drive

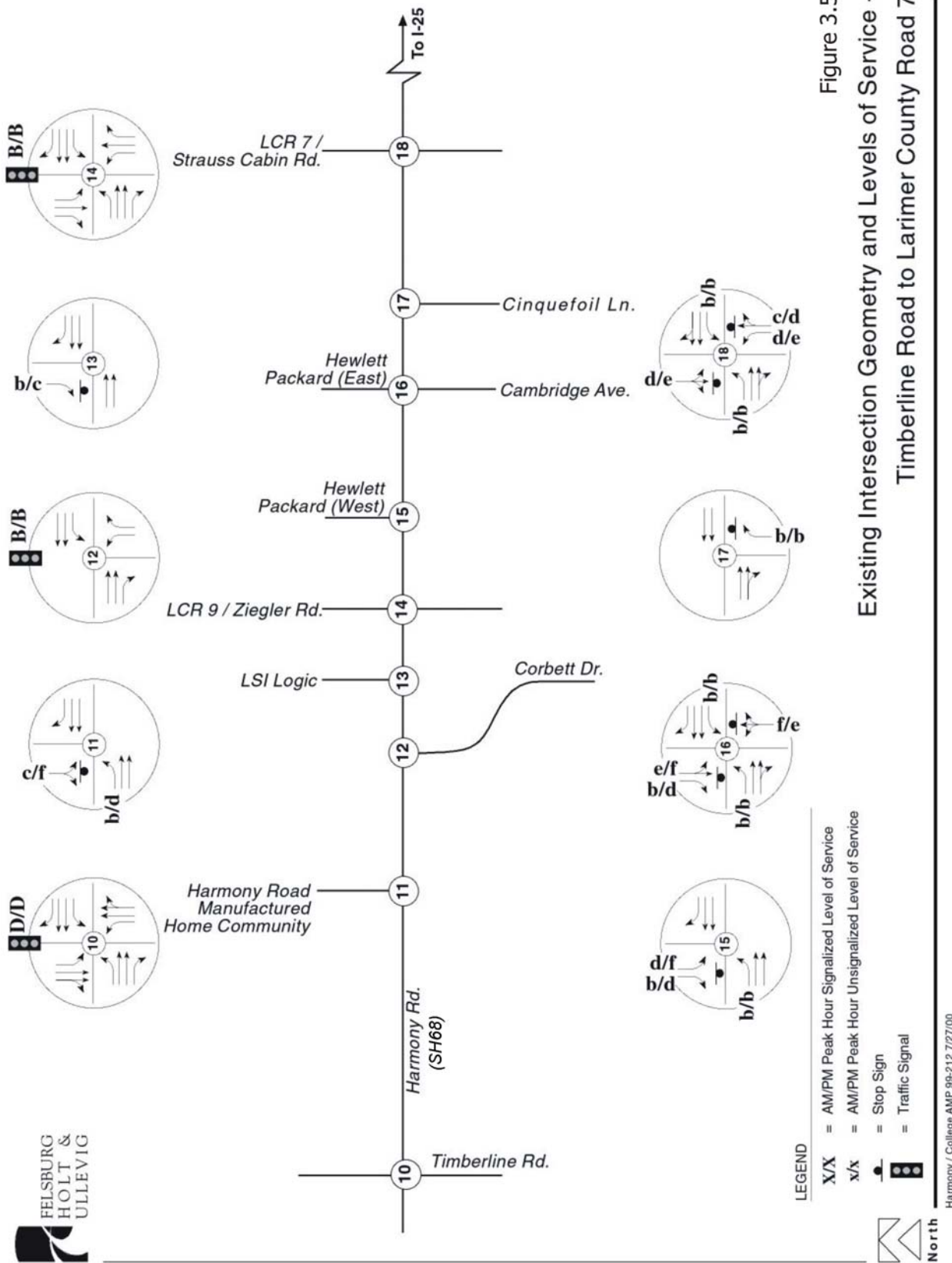
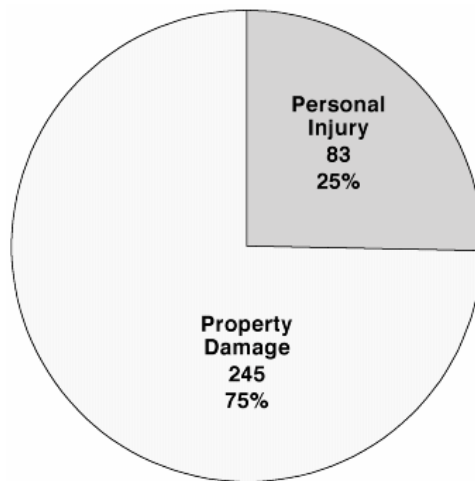


Figure 3.5  
Existing Intersection Geometry and Levels of Service -  
Timberline Road to Larimer County Road 7

## Accident Data

Accident data between January of 1997 and June of 1999 for SH68 between Strauss Cabin Road and South College Avenue (US287) was compiled from the City and the CDOT data bases. During this 30-month period, 328 accidents were reported along SH68. Of the reported accidents, 83 (25%) had at least one injury while the remaining 245 accidents (75%) involved property damage only. A 25% injury rate is below the statewide average for this type of state highway. See Figure 3.6.



**Figure 3.6: Corridor**

## Accidents by Severity

Table 3-2 presents a summary of accident types along SH68 during this period. The predominant types of accidents were rear-end (54.6%) and 90° angle (25.9%) collisions. Other common accident types were side-swipes (6.7%) and collisions with objects (5.8%). Accidents involving pedestrians or bicyclists accounted for 1.2% of the total number of accidents. Table 3-2 also shows that 16 (4.9%) of the corridor accidents did not fit any of the accident type categories presented in the table. Example of “other” types of accidents are collisions with wild animals or accidents of undefined origin.

A graphical depiction of the corridor accident history is included on Figures 3.7 through 3.14 (GRAPHICS PENDING)

**Table 3-2 Corridor Accidents by Type**

Accident Type	Number of Accidents	Percent Per Type
Rear-End	179	54.6%
90° Angle	85	25.9%
Side-Swipe	22	6.7%
Object	19	5.8%
Head-on	2	0.6%
Bicycle	3	0.9%
Pedestrian	1	0.3%
Overturning	1	0.3%
Other	16	4.9%
<b>Total</b>	<b>328</b>	<b>100.0%</b>

**Table 3-3 Accident Rate\* Comparison - Harmony Road (SH68) Versus Statewide Average**

Average

Year	Total Number of Accidents - Statewide	Statewide Accident Rate	Harmony Road Accident Rate				
			College to Hogan	Hogan to Lemay	Lemay to Timberline	Timberline to Ft. Collins City Limit	Ft. Collins City Limit to I-25
1997	16,337	3.16	4.42	3.19	3.43	0.52	0.55
1996	16,204	3.17	2.48	2.85	3.47	1.23	0.88
1993	13,871	3.09	3.18	2.78	3.72	0.27	0.57
1992	12,966	3.00	3.03	1.38	2.47	0.42	0.74
1991	11,950	3.04	3.62	1.45	1.42	0.37	0.31
1990	12,009	3.17	1.44	1.15	1.27	0.88	0.93
1989	12,301	3.46	3.06	1.13	2.30	0.28	0.76
1988	13,862	4.03	330.00	0.50	1.85	0.57	0.74
1987	14,293	4.16	2.82	1.66	2.82	0.71	0.37
1986	14,910	4.41	4.33	1.44	3.16	1.05	0.28
Average Accident Rates							
		3.47	3.17	1.75	2.59	0.63	0.62
* The accident rate is calculated by dividing the number of accidents by the vehicle miles of travel occurring along a particular highway section. The rate represents the average anticipated number of accidents per million miles of vehicle travel.							

The accident data also indicates that approximately 70% of all corridor accidents occurred at public road intersections. Most of these accidents occurred at the signalized intersections along the corridor; however, two mid-block locations showed a higher level of accident frequency than at other mid-block locations. These include:

- The 100 block - east of South College Avenue
- The 1800 to 1900 block - east of the Union Pacific Railroad

The accident frequency along SH68 was compared to the average accident rates for other state highways with the same roadway classification. SH68 is classified as a Federal Aid Primary (Urban) highway by CDOT and is divided into five analysis sections as shown in Table 3-3. These data were examined for a ten-year period and it was found that accidents occur along the SH68 corridor at rates less than the statewide average. Furthermore, between Timberline Road and I-25, the accident rate was much lower than the statewide average.

### **3.4 Projected Conditions**

#### **SH68 Typical Section**

The City of Fort Collins has designated SH68 as a Major Arterial Street (6 lanes). The cross-section for SH68 between Boardwalk and I-25 is a modified version of the typical Major Arterial, however. In addition to the Major Arterial characteristics of six through lanes (three in each direction), raised and landscaped center median, 10' bike lanes, an 80' setback from the roadway edge is required as a landscape buffer that contains an 8' pedestrian trail.

#### **Traffic Control**

Between I-25 and South College Avenue (SH287) new signals are planned at the following locations:

- Snow Mesa Drive – A new public road access that aligns with the access serving the Harmony Road Mobile Home Community and Poudre Valley Hospital Campus.
- Technology Parkway - A new public road access that aligns with the west access to Hewlett Packard.

In addition to these locations, potential new signals could be installed at the SH68 intersections with Strauss Cabin Road and at the Cambridge Avenue/ Hewlett Packard east access.

### **3.5 Projected Traffic Conditions**

Daily and peak hour traffic forecasts, shown on Figures 3-15 and 3-16, were developed from the following resources:

- Existing daily traffic volumes
- North Front Range model projections
- Daily traffic volume projections based on CDOT's 20 year growth factors
- City of Fort Collins estimates at a 3 percent per year compounded rate
- Calculated estimates from adjacent traffic studies with PM peak hour projections being 10% of daily traffic volumes.

This information indicates that the annual growth rate of average daily traffic along SH68 and the intersecting cross streets is approximately 3.10%. As can be seen in Figures 3.15 and 3.16, daily traffic volume projections range from 50,000 to 63,000 vehicles per day (vpd) per direction.

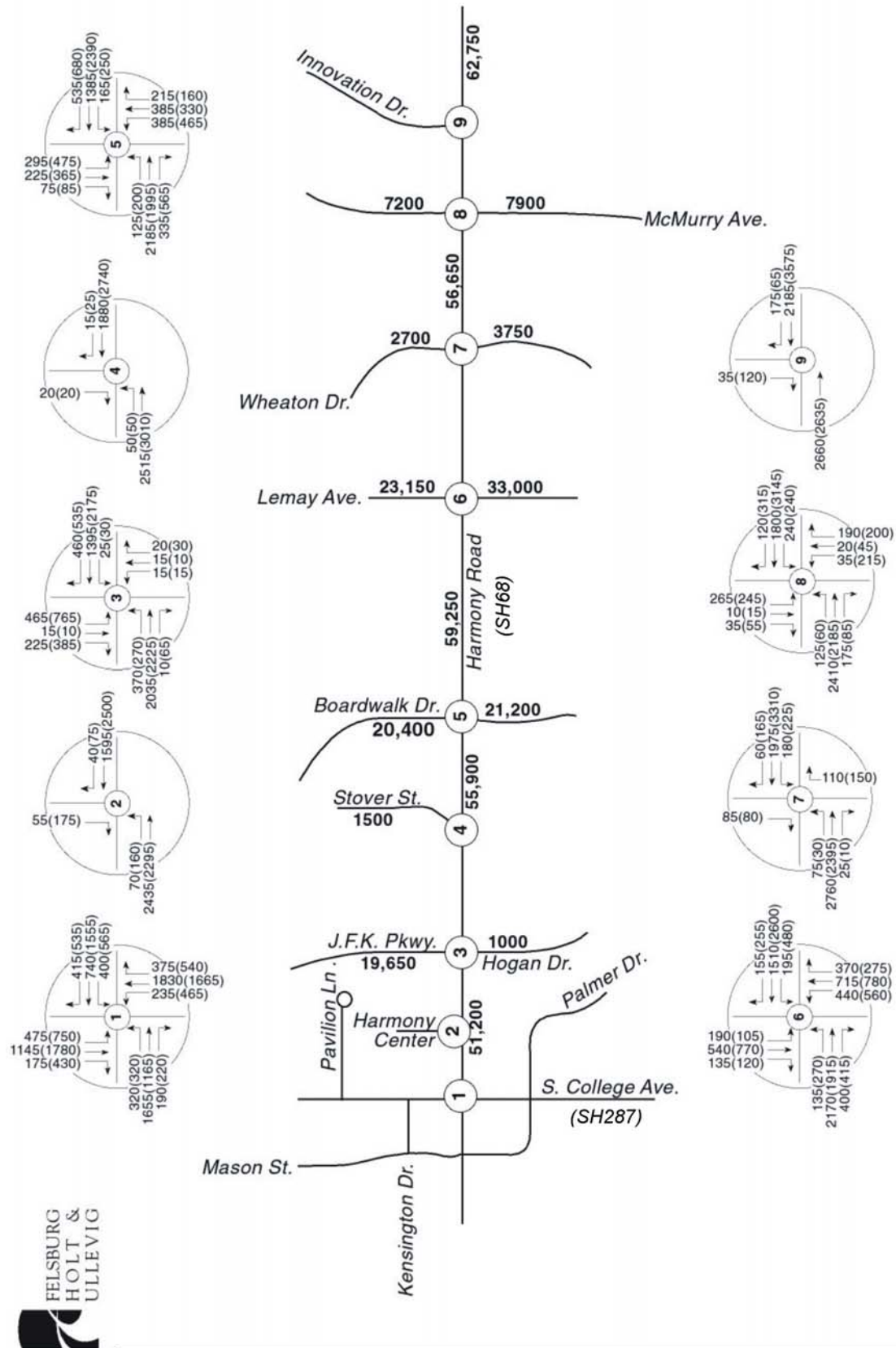


Figure 3.15  
 Projected Traffic Volumes  
 South College Avenue to Innovation Drive

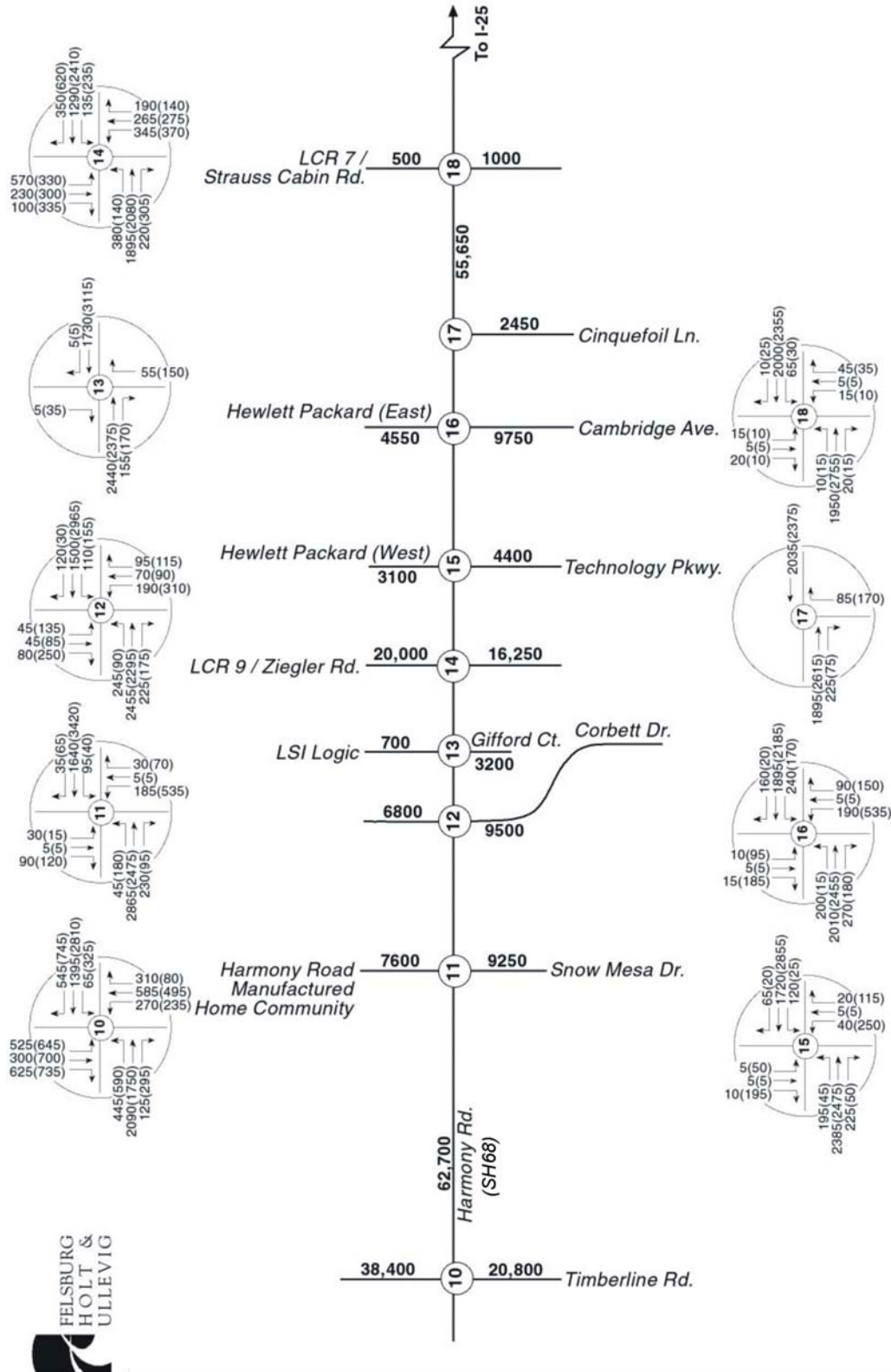


Figure 3.16  
 Projected Traffic Volumes  
 Timberline Road to Larimer County Road 7



### **Development Plan Recognition**

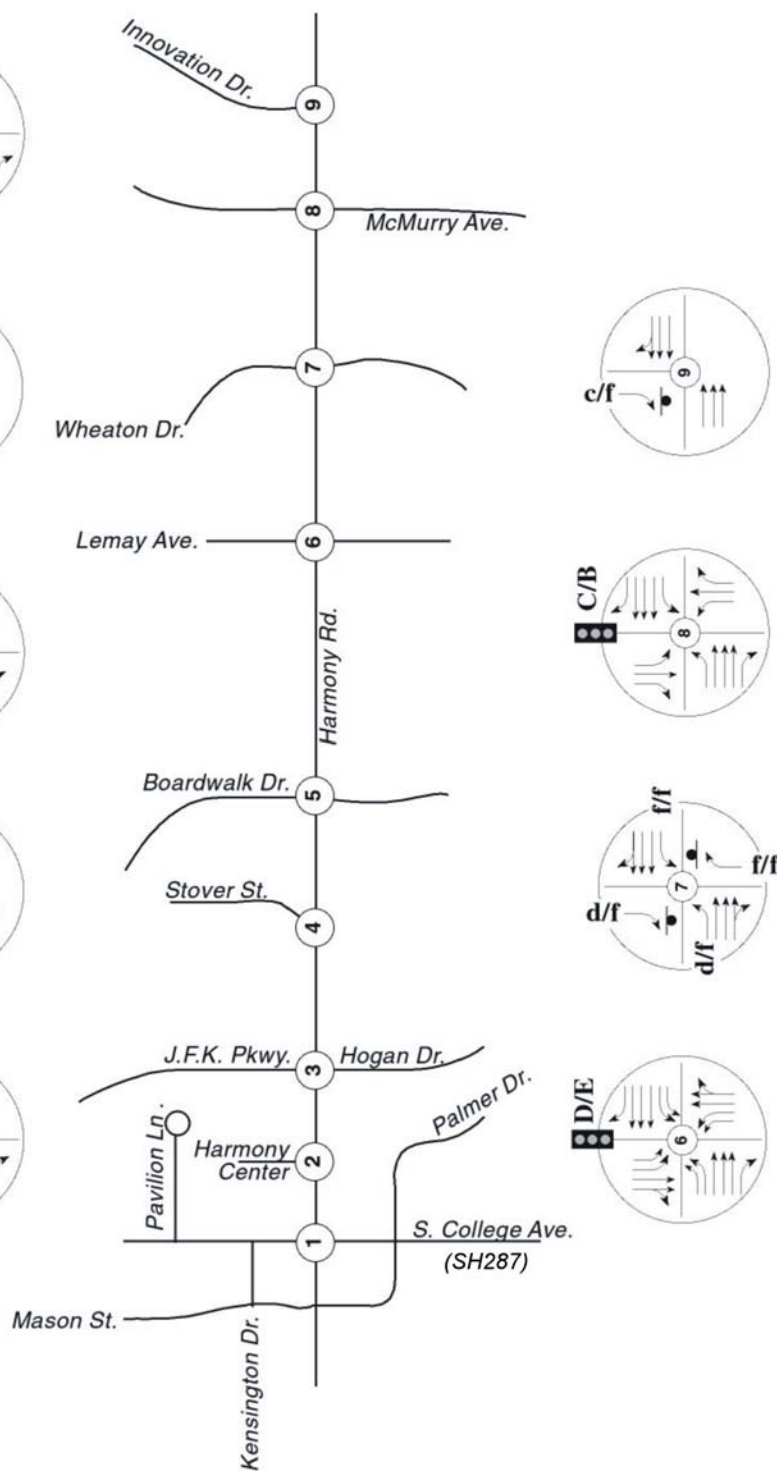
The recommendations of the Access Plan update were influenced by development that is likely to occur in the immediate future and also on long-range land use plans for the corridor.

## Traffic Operations

### *Intersection Geometry*

Figures 3.17 and 3.18 depict anticipated future intersection geometry. At each intersection the number of through lanes on each approach is consistent with the number of travel lanes as identified by the City's Master Street Plan. For example, the Master Street Plan identifies SH68 as a six-lane facility, therefore, at each intersection, SH68 is assumed to consist of three through lanes in each direction. Exclusive right turn lanes are to be provided along SH68 at most signalized intersections. Dual left turn lanes are to be provided on intersection approaches with relatively high left turn movements. In most cases, if dual left turn lanes are planned on one approach of an intersection, they were also planned on the opposite approach since the width would be available to do so. The locations where exclusive right turn deceleration lanes and/or dual left turn lanes are added include:

- South College Avenue (US287) – Exclusive right turn deceleration lanes on all approaches.
- Boardwalk Drive – Dual left turn lanes on the northbound and southbound approaches. Exclusive eastbound and westbound right turn lanes.
- Lemay Avenue – Dual left turn lanes on all approaches. Exclusive eastbound and westbound right turn lanes.
- McMurry Avenue – Exclusive eastbound and westbound right turn lanes.
- Timberline Road – Dual left turn lanes on all approaches. Exclusive eastbound, westbound and southbound right turn lanes.
- Snow Mesa Drive – Dual left turn lanes on the northbound approach only.
- Corbett Drive – Dual northbound left turn lanes.
- Ziegler Road – Dual left turn lanes on the northbound and southbound approaches. Exclusive eastbound and westbound right turn lanes.
- Cambridge Drive / Hewlett Packard East Access – Dual left turn lanes on the northbound approach only.



LEGEND

- X/X = AM/PM Peak Hour Signalized Level of Service
- x/x = AM/PM Peak Hour Unsignalized Level of Service
- ◻ = Stop Sign
- ◻◻◻ = Traffic Signal



Figure 3.17  
Projected Intersection Geometry and Levels of Service -  
South College Avenue to Innovation Drive

Harmony / College AMP 99-212 7/20/00

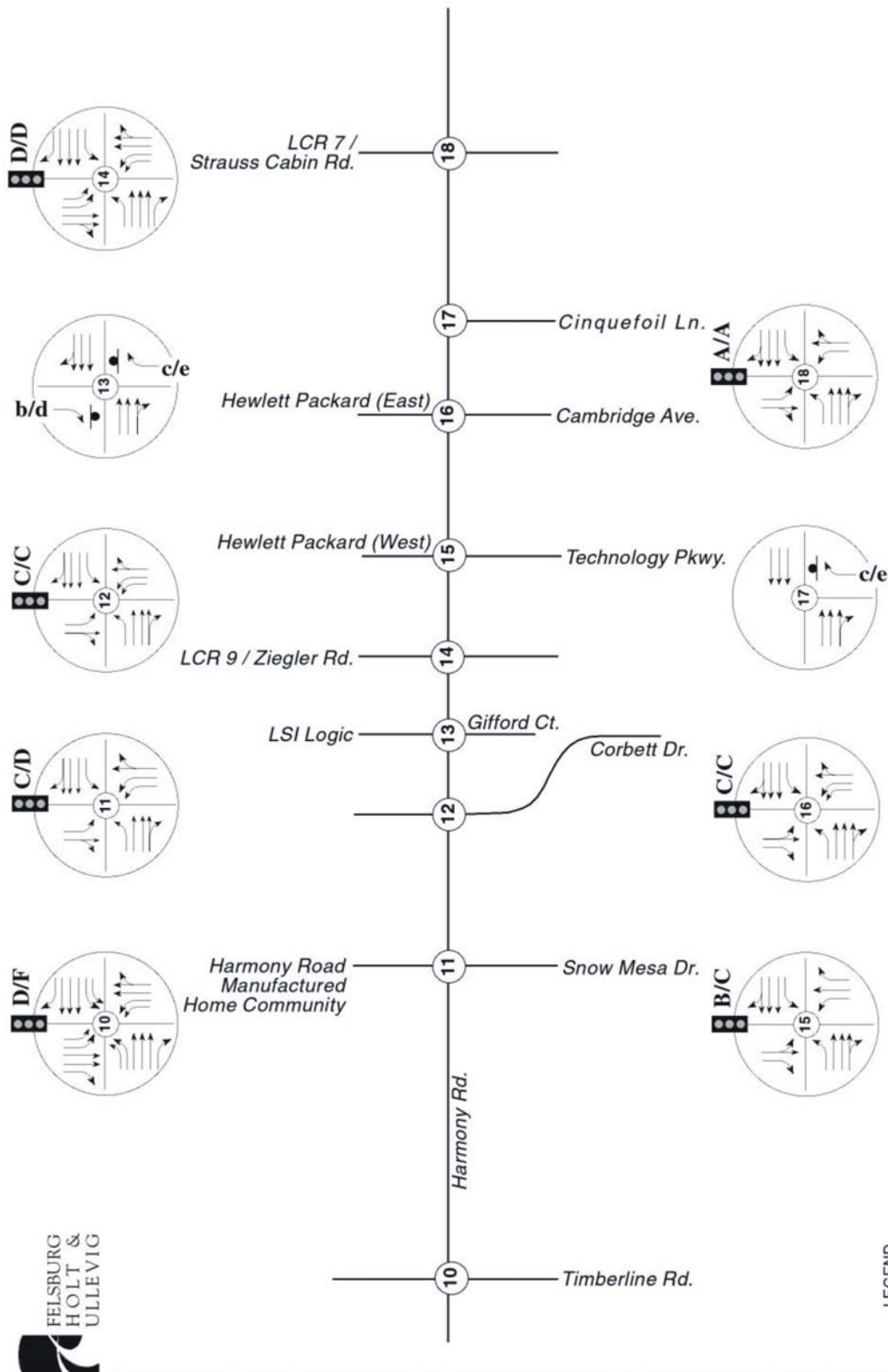


Figure 3.18  
Projected Intersection Geometry and Levels of Service -  
Timberline Road to Larimer County Road 7

### **3.6 Access Control Plan**

This section presents the updated Access Control Plan which has been formulated through the considerable input of the governing agencies, individual property/business owners and the public. After considering both existing and future conditions in the corridor, the plan defines how access for future development should be planned.

The narratives included in this chapter are meant to serve as a summary of the key features of the plan. A detailed explanation of every access change in the corridor is presented in the Intergovernmental Agreement. The Access Control Plan update is also illustrated on aerial photographs (Figures 3.21 through 3.28).

#### **Access Control Plan Update Recommendations**

##### ***Corridor Wide Improvements***

- Construct the City of Fort Collins Major Arterial cross-section between South College Avenue (US287) and Interstate 25. This section calls for six through lanes (three in each direction), a raised landscaped center median, 10' bike lanes, and an 80' setback from the roadway edge as a landscape buffer that contains an 8' pedestrian trail for the section from Boardwalk to I-25. Some of the raised median currently exists; however, the majority of the raised median will require construction. Raised medians should not be constructed until appropriate segments of the parallel street system are constructed so that alternate routes are available.
- Additional RIRO access can be provided at the approximate locations shown on the aerial photographs. The location of these access points can fluctuate and is dependent upon the size or type of redevelopment that may occur. The minimum access spacing for a roadway with a posted speed limit of 55 mph (current speed limit between x and y) is 450 feet, while for a posted speed limit of 40 mph (current speed limit between x and y), the minimum access spacing is 275 feet per the Access Code. For purposes of this plan the spacing between accesses is assumed to be centerline to centerline.

##### ***Long Term Improvements***

- Construct the City of Fort Collins Major Arterial Street section along the entire length of SH68, from US 287 to I-25. This section calls for six through lanes (three in each direction), a raised landscaped center median, 10' bike lanes, and an 80' setback from the roadway edge as a landscape buffer that contains an 8' pedestrian trail for the section from Boardwalk to I-25.
- New traffic signals are planned at Snow Mesa Drive, Technology Parkway, Cambridge/Hewlett Packard east access and County Road 7. These signals would be installed when these locations meet the appropriate warrants of the national Manual on Uniform Traffic Control Devices (MUTCD). New streets are to be constructed at some of these intersections.
- The intersection of Harmony and Cambridge/Hewlett Packard East Access would be designed to operate as two  $\frac{3}{4}$  intersections, providing for right in, right out, and left in traffic movements as an interim condition until it meets the appropriate MUTCD signalization warrants and/or the left turn movements at Technology Parkway fail.
- Private property access on the south side of SH68 between South College Avenue (US287) and

Hogan Drive would be limited to shared, right in/right out (RIRO) movements.

- Stover Street will become a  $\frac{3}{4}$  movement intersection, allowing for right in, right out, and left in traffic movements.
- The private property accesses on SH68 between the Union Pacific Railroad and Timberline Road will be changed to  $\frac{3}{4}$  movement on the south side and RIRO on the north side.
- Two  $\frac{3}{4}$  movements would be allowed east of Timberline Road, aligned with the entrance to the Poudre Valley Hospital entrance.
- Provide two RIRO access at Gifford Court/LSI Logic entrance.
- Cinquefoil Lane to be RIRO only.
- Provide for future cross access on the north side of SH68 west of Timberline Road.
- Construct a parallel access circulator on the north side of SH68 from the private  $\frac{3}{4}$  access on the north side east of Timberline Road.
- Construct a parallel access circulator on the north side of Harmony from the west of Corbett Drive and Gifford Court. The street would be constructed as an access circulator to minimize right-of-way impacts.
- Construct a parallel access circulator on the south side of SH68 between Technology Parkway / Hewlett Packard West Access and Cinquefoil Lane (possible extension to Strauss Cabin Road). The street would be constructed as an access circulator to minimize right-of-way impacts.