

## Chapter Two – Foundations of Fact

In Foundations of Fact, the US-56 Corridor was evaluated based on existing and historical conditions. These conditions, including physical, geometric, and operating conditions, access points, and crash history, were compared against recognized standards and current design guidelines to provide a Foundation of Fact relative to the existing conditions.



### PHYSICAL CONDITIONS

The physical conditions of the US-56 Corridor were divided between bridge, pavement, and geometric conditions.

**Bridge Conditions** - There are a total of twelve (12) bridges along the 22-mile long corridor. The majority of bridges cross natural features such as creeks, while only five bridges cross over roads or railroads. The longest bridges over natural features are 112 feet long, while the majority (five bridges) are less than 40 feet. The two longest bridges, over 400 feet in length, carry US-56 in the eastbound and westbound directions over I-35.

Only four of the bridges are greater than 50 years old, the remainder being less than 25 years old. The age of the bridges is reflected in their sufficiency index, a rating of 1 to 100 of the bridge conditions. Two bridges have a sufficiency index less than 50, while half have a sufficiency index greater than 90. The two with less than 50 are identified for replacement, while a third bridge is identified for rehabilitation. All three bridges are located in Douglas County.

**Pavement Conditions** - In general, the overall pavement condition along the US-56 roadway is rated as an acceptable condition. The majority of the roadway (more than 80 percent) consists of composite materials while the remainder varies between bituminous (one mile) and concrete pavement (approximately three miles). Along US-56, shoulders are narrow and terrain is often rolling.

Several different assessments of the pavement reinforce the overall acceptable conditions rating. In terms of roughness, only three miles are rated “tolerable”, or minimally acceptable, one of those miles being the bituminous pavement and the other two miles essentially within Baldwin City. Approximately five miles have been identified as crack seal candidates, all in Douglas County. From a pavement performance assessment, only six miles are rated as “tolerable”, all in Johnson County.

**Geometric Conditions** - Based on available data, the geometric conditions of US-56 were evaluated based on current design guidelines for horizontal and vertical design elements. From a horizontal design component, the curvature on US-56 generally is consistent with the posted speed limits. However, there are locations where the vertical alignment has provided less than ideal alignments due to the rolling terrain.

### OPERATING CONDITIONS

The diverse nature of the US-56 Corridor brings with it different methods of evaluating the existing operating conditions, as rural highway segments are evaluated differently than intersections in communities.

**Highway Segments** - Two-lane highway segments are evaluated primarily by the ability for drivers to pass and travel at their preferred speed.

The rural highway segments, from US-59 to Baldwin City, from Baldwin City to Edgerton, and from Edgerton to Gardner, all operate today with acceptable conditions, although the segment from Edgerton to Gardner is beginning to approach the thresholds of acceptable conditions due to the heavy directional split of traffic (eastbound in the morning and westbound in the evening).

**Intersections** - In communities, traffic operating conditions are measured by the amount of delay experienced by drivers at intersections. For signalized intersections an average delay is

calculated for all drivers while for stop-controlled intersections delay is calculated for movements that must yield to other traffic, such as a side-street approach or a left-turn off of US-56.

With the intersection improvements currently under construction at Moonlight and US-56, all of the intersections operate with acceptable conditions today.

### TRAFFIC PATTERNS

Traffic data was collected along the US-56 Corridor, including peak hour traffic volumes, daily volumes, and travel speeds. **Figure 2-1** summarizes the existing traffic volumes on US-56, measured by mile marker from west to east. Travel speeds were also measured at several locations and found to be generally consistent with the posted speed limits.

### ACCESS POINTS

Using KDOT’s data set of access points, a rate of access points per mile rate was calculated that shows a range from 8 to over 60 access points per mile, illustrated on **Figure 2-2**. As could be expected, access point rates increase in the city limits where traffic volumes, speed slows, and commercial activity increases. Public street access points are also shown.

Comparative access point rates vary based upon rural high-speed characteristics as well as low- to moderate-speed suburban/urban characteristics. In rural areas, a guideline of eight to ten access points per mile is suggested and is achieved along much of Douglas and Johnson County. Rural areas can exceed this threshold and currently occurs where six five-acre residential parcels each have direct access to US-56 between Edgerton and Baldwin City.

For urbanized areas, a guideline of 20 to 30 access points per mile is suggested. On a mile basis both Baldwin City and Edgerton are within or below this threshold. However, in the City of Gardner, essentially Waverly through Moonlight, the access point rate per mile are more than double the desired rates.

Access point rates are not the only means to assess access conditions. Maintaining the functional area of intersections is important as well as the spacing of traffic signals. Yet access point rates do offer a sense of the task ahead if the intent is to bring access point rates into a desired range. Techniques such as removal, consolidation, or relocation of access points can result in a reduction of rates.

### CRASH HISTORY

The crash history along US-56 was collected for a five-year period from 2003 to 2007. During that time period there was an overall downward trend in crashes.

- Intersection and intersection-related crashes accounted for the majority of incidents (51%).
  - Top locations include Moonlight (in Gardner), US-59 and 6th St (in Baldwin City).
  - Each of these top locations has had improvements made to them or has improvements under construction.
- Five fatal accidents occurred.
  - Two occurred at the junction of US-59, which was addressed with the addition of a four-way STOP control.
- The majority (67%) of the crashes occurred within cities, with only 33% occurring in rural areas.

### PLANNING ASSUMPTIONS

During this phase of the planning process, the study team assembled and reviewed adopted comprehensive, land use and policy plans, and other development plans. These plans were used as a basis of the Foundation of Facts, and served as a baseline for calculating residential and non-residential demand.

In addition, baseline assumptions were made regarding anticipated changes to the transportation elements in the region, including:

- the upgrading of K-7 to a freeway from I-35 north to I-70;
- changes in access crossing the BNSF Railroad in the vicinity of the anticipated intermodal facility; and
- a new interchange on I-35 in the vicinity of 199th Street and Waverly Road.

A summary of the project assumptions, including grade separations and grade crossing removals, near the BNSF intermodal facility is shown on **Figure 2-4**.

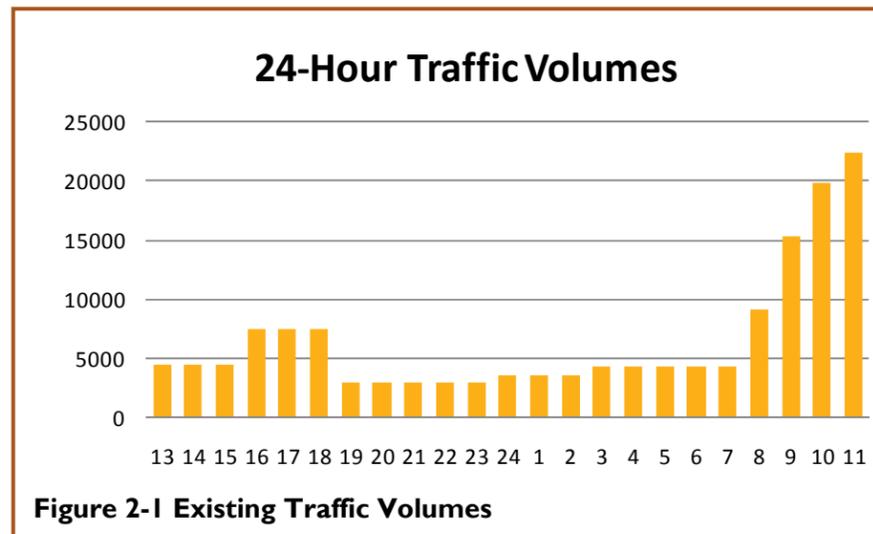


Figure 2-1 Existing Traffic Volumes

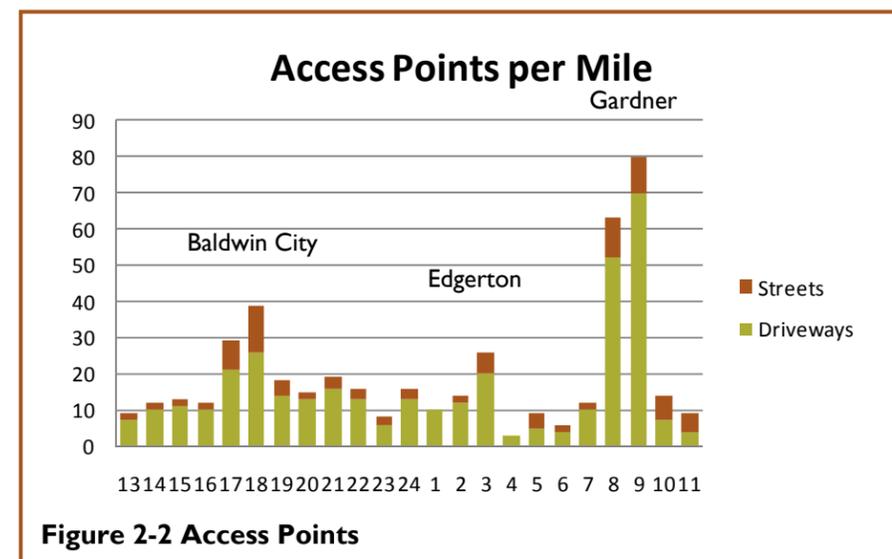


Figure 2-2 Access Points

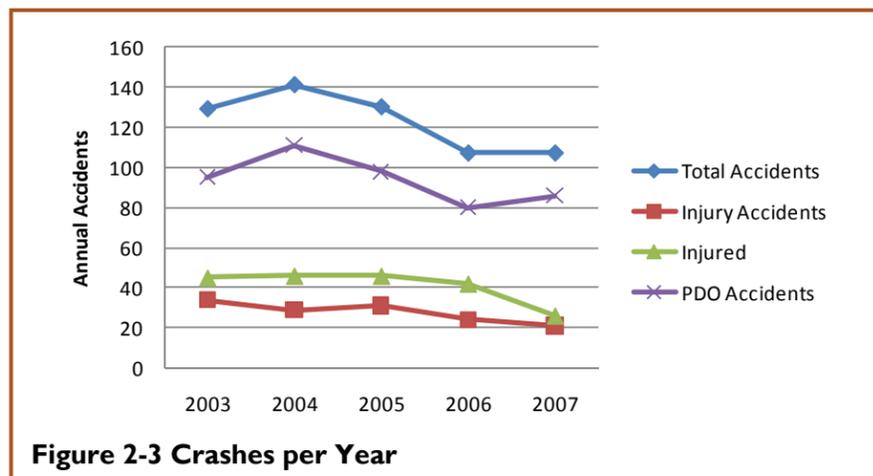


Figure 2-3 Crashes per Year

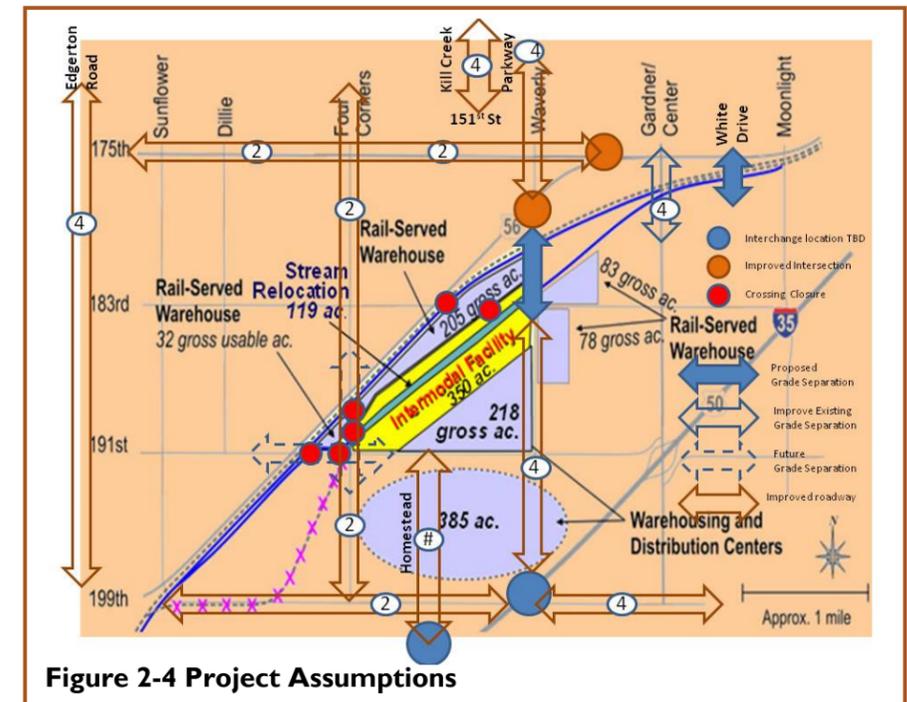


Figure 2-4 Project Assumptions

