



**PDC INC. ENGINEERS**

*Transforming Challenges into Solutions*

**Anchorage  
Fairbanks**

**TECHNICAL MEMORANDUM**

**Date** 11/7/2005

**PDC #** F01095

**State #** 63216

**Name** South Cushman Street Improvements

**Subject** Access Management

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Topic	Discussion
<p><b>Introduction to standards evaluated</b></p> <p><i>* corner clearance is defined as the minimum distance from the nearest face of curb, or nearest edge of traveled way for uncurbed roadways, of an intersecting public roadway to the nearest edge of a driveway.</i></p>	<p>Safe and efficient operation of a roadway is the goal of access management. There are several standards available that discuss the issue of access management. The purpose of this memorandum is to describe the standards for both corner clearance* and driveway spacing, and recommend an appropriate level of access management for the South Cushman project.</p> <p>The design standards for this project include federal, state, and municipal guidelines. Therefore, the following standards are evaluated: (1) AASHTO/TRB, (2) ADOT Preconstruction Manual, and (3) Design and Construction Guidelines for the City of Fairbanks Street and Drainage System, March 1986.</p> <p>(1) AASHTO and TRB provide guidance that is focused on maintaining corridor efficiency and providing an appropriate level of safety. AASHTO applies stopping sight distance, perception/reaction time, and maneuvering distance to determine driveway placement. TRB recommendations apply AASHTO geometrics, but also examine the available network of local and connector streets. The Level of Service and efficiency of urban arterials can be maintained by moving access to side streets.</p> <p>(2) The ADOT Preconstruction Manual (PCM) stated objective is to provide "safe, efficient movement of through traffic. If driveways directly accessing the arterial are necessary, then their number, location, and design will be controlled to minimize the effect on through traffic." Based on this criterion, the PCM provides a tiered approach to corner clearance and driveway spacing based on the trip generation of the facility that is being accessed and the speed of the roadway.</p> <p>(3) The Design Guidelines for the City of Fairbanks takes the small lot size of many parcels in the Fairbanks area into consideration for the recommended corner clearance in an attempt to provide corner lot access to the typical 50' wide lots.</p>

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**AASHTO (2001) /  
Access  
Management  
Manual, TRB  
(2003) Standard**

*\* The functional area extends both upstream and downstream from the physical intersection area. It includes the decision and maneuvering distance plus the required queue.*

Intersection Corner Clearance:

Ideally, driveways should not be located within the functional area\* of an intersection or in the influence area of an adjacent driveway. Access connections too close to intersections can cause serious traffic conflicts that result in congestion and accidents. The functional area of an intersection is the area that is critical to its safe and efficient operation. This is the area where motorists are responding to the intersection, decelerating, and maneuvering into the appropriate lane to stop or complete a turn.

AASHTO does not directly define the physical limits of the functional area, but the application of AASHTO guidelines as determined by the Transportation Research Institute (Oregon State Univ.) are summarized below as a logical interpretation of AASHTO guidance (design speeds of 35mph are used for the lengths below):

**Upstream Functional Area: 370' (desirable); 270' (minimum) plus the queue length.** The minimum length is based on: 1.0 second perception-reaction time, 4.5 fps average deceleration while moving laterally into the turn lane, 9.0 fps average deceleration thereafter.

The downstream functional area dimensions can be determined in three different ways, depending on the conditions present.

**Downstream Functional Area:**

**250' (Stopping Sight Distance).** This criterion would allow the driver to clear the intersection before having to rapidly decelerate in response to a maneuver at a downstream intersection or driveway. This simplifies the drivers task within the intersection and thus minimizes the chances of driver mistake and collisions.

**175' (Right-Turn Conflict Overlap)** This criterion is based on allowing the driver on the thru street to monitor the right turns from driveways and adjust accordingly to avoid a collision.

**90' (Left-Turn Driving Task)** A driver turning left through an unmarked intersection must accelerate and be properly positioned in the traffic lane which they are entering. This is a complex task (although usually performed at low speeds), and drivers should have 2 to 3 seconds after completing the maneuver before being presented with the potential of a vehicle entering the roadway from a driveway. An example of this turning maneuver would be a driver turning from westbound Airport Way to southbound South Cushman Street.

Driveway Spacing:

AASHTO recommends that driveways not be located within the influence area of an adjacent driveway. This influence area is defined as the impact length, perception-reaction time, and the car length. According to Exhibit 9-101, 50% of vehicles in the thru lane are impacted at an approximate distance of 100' in advance of the driveway at 30 mph speed. Adding the perception-reaction time and the car length can increase the driveway

separation to over 350 feet.

**ADOT  
 Preconstruction  
 Manual Standard**

*\* hourly volume is based on the peak traffic-generating hour of the off-street facility*

Intersection Corner Clearance:

Corner clearance is based on two criteria: hourly volume and speed. The standards provided in the PCM essentially provide stopping sight distance at high volume traffic generating facilities, and reduces the clearance as accident potential (vehicles per hour) is reduced. If the hourly volume\* is less than 10 vph, Table 1190-4 is used to determine the corner clearance based on the functional classification of the driveway in conjunction with whether the crossroad is curbed or uncurbed. For hourly volumes greater than 10 vph, Table 1190-4 is used to determine the corner clearance based on speed and traffic generation. The results of applying this criteria to South Cushman Street and related collector streets is shown below:

**Hourly volume ≤ 10 vph:**

Curbed crossroad	60 feet
Uncurbed crossroad	70 feet

**Hourly volume > 10 vph**

	<100 vph	100-250 vph	>250 vph
30 mph (Collector Streets)	80 feet	150 feet	200 feet
35 mph (South Cushman)	110 feet	210 feet	260 feet

Driveway Spacing:

The distance between driveways *on the same parcel* is also related to the hourly volume (Table 1190-3).

**Hourly volume ≤ 10 vph: 75'**

**Hourly volume >10 vph: 260'**

**City of Fairbanks  
 Standard**

The City of Fairbanks provides limited guidance on corner clearance and driveway spacing as summarized below:

**Intersection corner clearance: 30'**

**Driveway Spacing: 1 per lot.** More than one driveway entrance per lot may only be allowed with written authorization from the Engineer.

**Analysis**

**AASHTO/TRB Standards:**

- Results in the closure of 26/28 driveways on South Cushman Street within the project area and 2 intersections (east leg of 16<sup>th</sup> Ave and east leg of 14<sup>th</sup> Ave). Some buildings have multiple driveways.
- 2 buildings would have access from South Cushman Street. The remaining 19 buildings would be accessed from collector roads.
- Displaces traffic on South Cushman Street to residential and

- residential/commercial streets (Stacia Street, Lacey Street)
- Creates the highest degree of safety, but has the greatest impacts to property owners.

PCM Standards:

- Results in the closure of 18/28 driveways on South Cushman Street within the project area and 2 intersections (east leg of 16<sup>th</sup> Ave and east leg of 14<sup>th</sup> Ave). Some buildings have multiple driveways.
- 12 buildings would have access from South Cushman Street. The remaining 9 buildings would be accessed from collector roads.
- Balances safety and impacts.

City Standards:

- Results in the closure of 0/28 driveways on South Cushman Street within the project area.
- Does not provide safe, efficient movement of thru traffic as required by DOT and AASHTO.
- Lowest level of safety and impacts.

**PDC  
recommendations  
for closures**

Driveways: The standards discussed in this memorandum show that *corner clearance and driveway spacing is a function of the speed of traffic, the trip generation of the off-street facility, and the complexity of the decisions a driver encounters.* Within the project area of the South Cushman Street improvements, drivers are presented with simple intersections, speeds are low, and most businesses are small traffic generators. In addition, the proposed two-way center turn lane and 5 foot shoulders allows for emergency maneuvering. Due to these factors, **PDC recommends driveway closures, relocations, and consolidations based on the PCM standards.** A trip generation summary and figures showing the driveway closures are attached.

Intersections: Proper spacing of roadway intersections is an important access management issue. Too many intersections increase the opportunity for crashes, delays, and congestion, but too few intersections do not provide adequate routes. Various factors affect the spacing requirements, but at a minimum, the functional areas of intersections should not overlap. The functional areas of 14<sup>th</sup> and 16<sup>th</sup> Avenues currently overlap those of Airport Way and 17<sup>th</sup> Avenue, respectively. **PDC recommends closure of 14<sup>th</sup> and 16<sup>th</sup> Avenues due to this inadequate spacing and the availability of other nearby routes.**

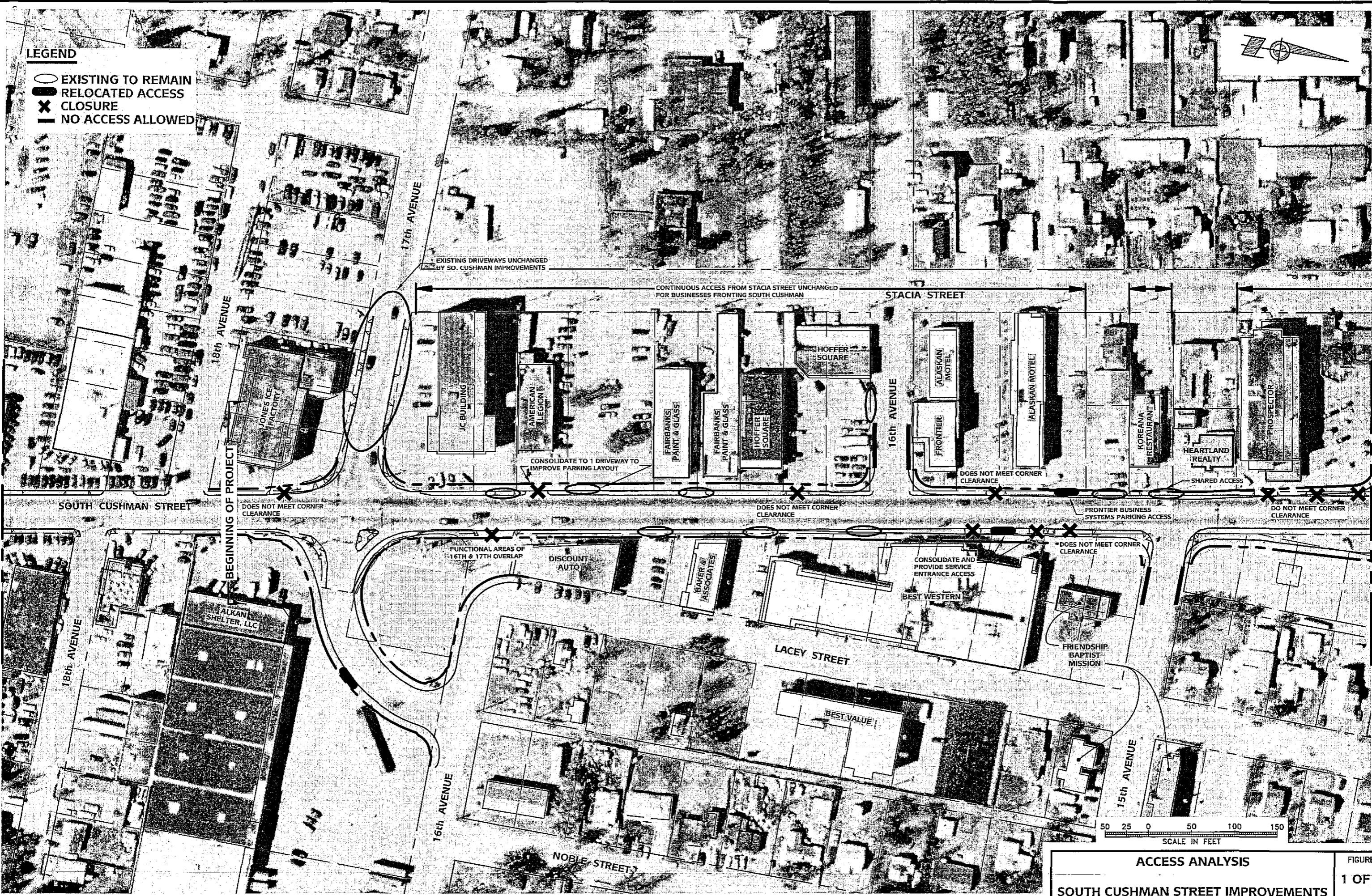
## South Cushman Improvements Trip Generation & Corner Clearance

Physical Address	Building	Veh/hr (Trip Generation, 7 <sup>th</sup> Ed.)*	Corner Clearance (ft)
1710 S. Cushman	Jones Ice Factory Building	34	110
1701 S. Cushman	Alkan Shelter, LLC	12	110
1648 S. Cushman	JC Building	50	110
1634 S. Cushman	American Legion, Post 57	48	110
1620 S. Cushman	Fairbanks Paint and Glass	20	110
1616 S. Cushman	Hoffer Square	67	So. Cush – 110 16 <sup>th</sup> Ave - 80
1575 S. Cushman	Discount Auto	11	110
1553 S. Cushman	Baker Building	6	70
1550 S. Cushman	Frontier Business Systems	8	70
1546 S. Cushman	Alaska Motel	21	110
1528 S. Cushman	Koreana Restaurant	17	110
1522 S. Cushman	Heartland Realty	2	70
1521 S. Cushman	Best Western and Best Value Inn	220	210
1512 S. Cushman	Prospector Outfitter	127	So. Cush – 210 15 <sup>th</sup> Ave - 80
1501 S. Cushman	Friendship Baptist Church	25	So. Cush – 110 15 <sup>th</sup> Ave - 80
1448-1452 S. Cushman	Pewter, LLC (Sweet Basil, Mr. Rock and Roll, Good Karma)	50	So. Cush – 110 15 <sup>th</sup> Ave - 80
1420 S. Cushman	Drop Inn Café and El Sombrero Restaurant	73	110
1410 S. Cushman	Thrifty Liquor/CSI	15	110
1330 Cushman	Park and Sell	89	110
607 Gaffney Road	Donut Shoppe / Mother Lode Pull Tabs	41	So. Cush – 110 Gaffney - 80
537 Gaffney Road	Kodiak Jacks	240	So. Cush – 210 Gaffney - 80

\* Trip generation listed is the average rate for the peak hour of the generator. For buildings with multiple businesses, the trip generation listed is a summation of all the businesses.

**LEGEND**

- EXISTING TO REMAIN
- ◐ RELOCATED ACCESS
- ✕ CLOSURE
- ▬ NO ACCESS ALLOWED

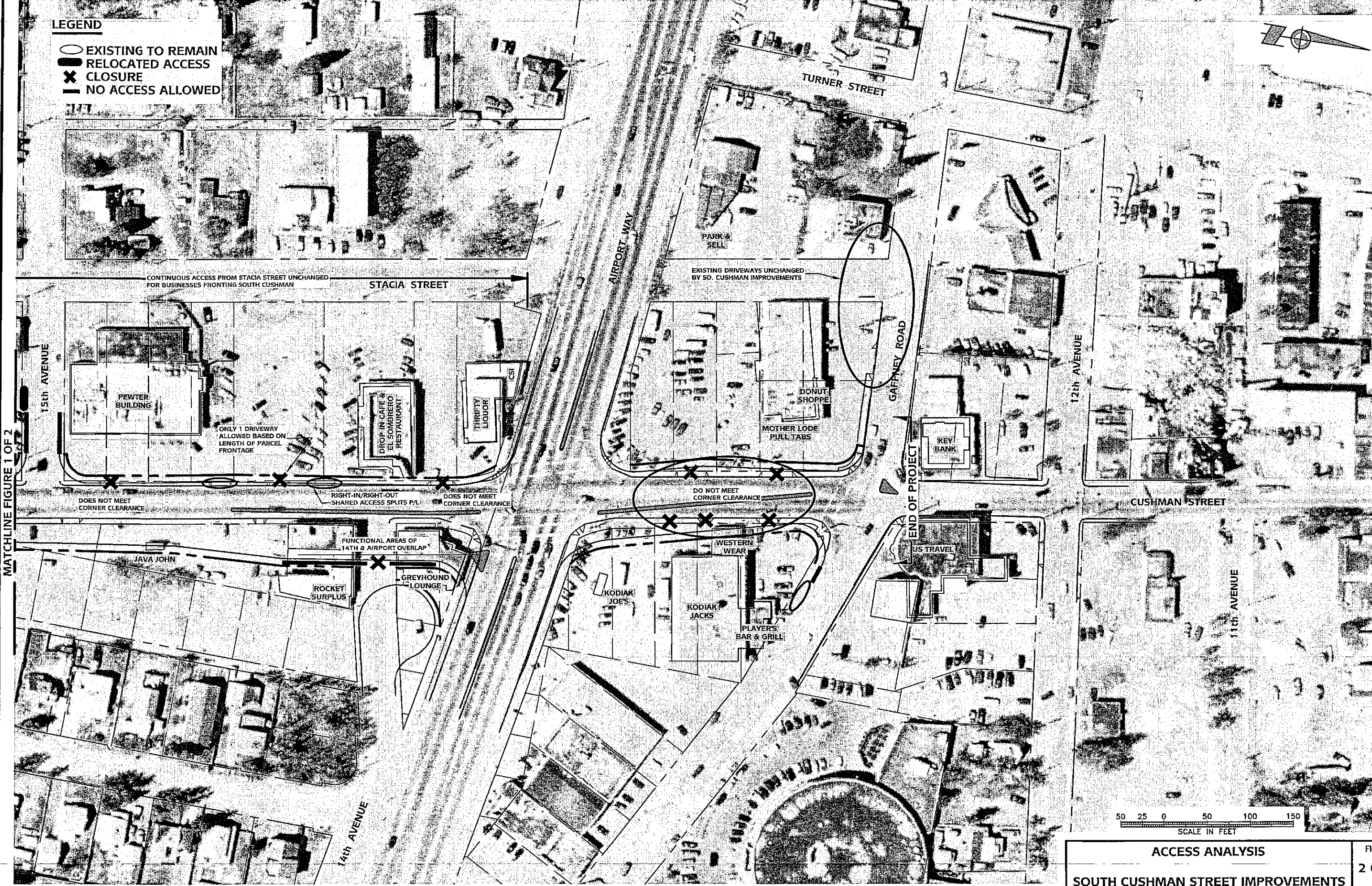
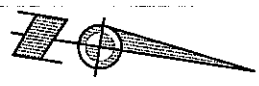


**ACCESS ANALYSIS**  
**SOUTH CUSHMAN STREET IMPROVEMENTS**

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**LEGEND**

- EXISTING TO REMAIN
- ▬ RELOCATED ACCESS
- ✕ CLOSURE
- NO ACCESS ALLOWED



MATCHLINE FIGURE 1 OF 2

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**ACCESS ANALYSIS**  
**SOUTH CUSHMAN STREET IMPROVEMENTS**