Broadway Corridor Study, Euclid to Country Club Road

The Sidewalk-Only Option

An Evaluation of the Impacts Associated with Constructing an ADA-Compliant Sidewalk System Without Widening the Existing Roadway.

Submitted to

City of Tucson Department of Transportation

by

HDR Engineering

February 6, 2014

Draft - 2/6/14

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RE: Broadway Corridor Study, Euclid to Country Club
Sidewalk-Only Evaluation
HDR No. 105002

The attached report documents the findings of a study to determine what parcels would likely need to be acquired to construct sidewalks on Broadway. No widening of the roadway itself is contemplated in this scenario. The sidewalks would meet minimal City standards and be compliant with the Americans with Disabilities Act of 1990 (ADA).

These findings are based on the assumption that parcels either physically impacted by the sidewalk or that would face loss of parking to the extent of being no longer economically viable. For the purpose of this study, it is assumed that such parcels would be fully acquired. (In fact, the City may not be compelled to acquire parcels that would lose parking that does not exist legally.)

Not considered here are other factors potentially limiting the future use of parcels such as lack of space for loading zones, trash pickup, or increased parking that might be required. This study simply assesses loss of parking and its effect on current functionality.

This study is based on this relatively simplistic assumption and does not rise to the level of detail of the analyses that is being applied to the evaluation of various widening scenarios. It does however give a sense of the cost and property impacts likely to be encountered.

These impacts are significant. The results are that 57 parcels would be fully acquired and partial acquisition from 47 others would be needed. Of the 57 full acquisitions, 47 would involve structures identified previously to be of historic significance either currently or potentially in the future. The cost of the full acquisitions is estimated here to be in the $17 to $24 million range. The cost of the partial acquisitions has not been estimated and not included in this range.

Note that these impacts and this cost would likely be incurred in the future in any event. Maintenance activity such as a pavement overlay would trigger construction of an ADA compliant sidewalk system.

This has been an interesting and enlightening exercise. Please feel free to contact me with any further questions or concerns you might have at 584-3644 or michael.t.johnson@hdrinc.com.

Sincerely,
HDR ENGINEERING, INC.

Michael T. Johnson, PE
Vice President

Attachment

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Overview

The purpose of this study is to estimate the number of parcels likely needing to be acquired if the Broadway improvements were limited to constructing new sidewalks. Under this scenario, sidewalks would be placed behind the existing curbs and no widening of the roadway would occur. The sidewalk system would comply with the Americans with Disabilities Act of 1990 (ADA) as well as City of Tucson minimum standards for sidewalks along arterial roadways. Cars accessing private property would not be permitted to park or maneuver over the new sidewalks except at designated driveway locations.

The general approach to this study is to determine the minimum width of area behind the existing curb needed for a suitable sidewalk system, both to accommodate pedestrian movement and to provide ADA compliant driveway crossings. Each parcel is then examined to determine if it would be impacted by the sidewalk construction, either directly or through loss of parking. Those that appear to be substantially damaged are considered here as likely full acquisitions.

New right-of-way will be needed in many locations for even a minimal sidewalk system. In some cases, buildings are close enough to the existing roadway that they would be directly impacted. Often though, the impact would be indirect through loss of parking or access to that parking. Loss of parking can damage a parcel to the extent that it is no longer economically viable. It is assumed for this study that such parcels would be fully acquired. The parking issue is particularly acute along Broadway where many of the existing parcels are relatively small and existing parking is already problematic. Especially vulnerable are the older strip commercial developments that depend on front parking accessed through curb cuts directly from Broadway.

The disposition of existing buildings on parcels identified as total acquisitions is not addressed here. The viability of some could be maintained by providing offsite parking nearby, through relaxation of regulations and design standards, or through creative combination of acquired parcels. The ability to provide replacement parking cannot be reliably determined until the actual acquisition process is underway except using property already owned by the City. The extent to which regulatory relief could come into play cannot be reliably determined without such tools actually in place. The acquisition process relies on economic as well as regulatory factors to determine damages. As a result, the extent to which acquisition could be reduced through such measures cannot be reliably determined at this point, and no attempt to do so has been made here.

Other factors could affect the general viability of buildings such as lack of space for loading zones, waste pickup, and number of parking spaces required for particular uses. This study does not address that issue either, in effect presuming that if the current function of a parcel is not diminished by the sidewalk improvements, then the parcel has not been damaged and need not be acquired. A more detailed investigation may find that more acquisitions are needed.

As a matter of interest, the historic status of parcels considered to be total acquisitions has also been determined and tabulated. A rudimentary estimate of acquisition and relocation costs based on current full cash value of parcels acquired is also provided.

This analysis here is cursory for the reasons cited above. It does however provide an overall sense of the number of parcels likely needing to be acquired for a sidewalk-only project, and a reasonable estimate of the associated acquisition cost.

Examining a sidewalk-only alternative addresses questions that have come up in past Citizen Task Force meetings and other venues. It also provides insight into parking impacts that will be encountered in the upcoming evaluations of various street configuration alternatives.

The general approach to this study has been to determine the width of area behind the existing curbs needed to construct a sidewalk system that complies with ADA and City of Tucson requirements. The width of the "sidewalk zone" was first established as well as that needed for compliant driveway crossings. Each parcel was then examined to determine if any parking would be lost due the sidewalk construction and if so, if that loss would likely render the parcel economically unviable. Maps used for this process are provided as attachments to this report. A table summarizing the calculations and results is provided as an appendix. Figures 3a and 3b (pages 11 and 12) provide an overview of the parcels found likely to be acquired.

The Findings here are that 57 parcels would be fully acquired and partial acquisition from 47 others would be needed. Of the 57 full acquisitions, 47 would involve structures identified previously to be of historic significance, either currently or potentially in the future. A cursory analysis of cost resulted in an estimated range of $17 to $24 million. This does not include the cost of the partial acquisitions.

The remainder of this report describes this process and the results in more detail.

References

Any significant expenditure of public funding on Broadway will require bringing the corridor into compliance with ADA requirements. The following references have been used here as guides to how new sidewalks, driveway crossings, and curb ramps would have to be developed.

1. "*Accessible Sidewalks and Street Crossings – an informational guide*", U.S. Department of Transportation Federal Highway Administration (FHWA-SA-03-01); undated. This is FHWA's interpretation of accessibility standards of the ADA and other applicable federal laws. This reference is referred to as "FHWA" in this discussion.
2. "*City of Tucson and Pima County Standard Details for Public Improvements – 2003*". Details of interest here cover sidewalks, driveway crossings, and curb ramps. These have been formulated to meet minimum ADA standards. References made here to "City" refer to these standards.

Sidewalk Zone System

FHWA describes several components of the "sidewalk zone" necessary for good pedestrian function and prescribes minimum widths necessary to meet ADA. City standards correspond to minimum preferred ADA values.

1. "Pedestrian Travel Zone" is the clear area reserved for pedestrians. FHWA states the minimum width should be 6' to 10'. The City requires a minimum width of 6'.
2. "Building Frontage Zone" is the distance between the Pedestrian Travel Zone and the building face or fence. This provides a "shy" distance for pedestrian comfort as well as space for open doors and other protrusions from the adjacent buildings. A minimum width of 2' is called for by both FHWA and City standards.
3. "Planter-Furniture Zone" provides space for landscaping, street furniture, signs, hydrants, poles and other utilities to ensure that the pedestrian travel zone is free of obstacles. FHWA does not state a minimum width but prefers at least 6' for arterials. City requires a 3' minimum. A width of at least 5' would be needed for street trees. Since this zone would not be used for planters or furniture in this case, it is more descriptively referred to here as the "Street Signs and Utility Zone".

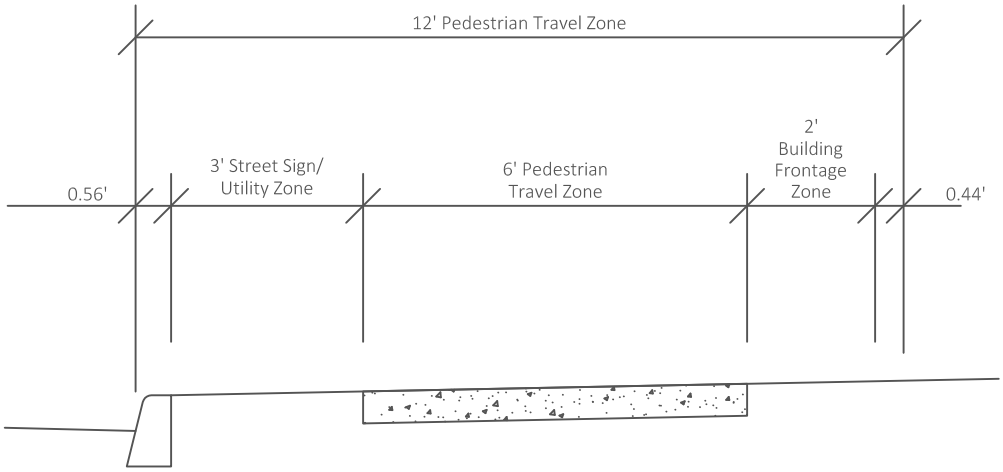
Based on the minimum values stated here, the minimum width of the overall sidewalk zone is 11' measured from the back of curb, or about 11.6' from the front face-of-curb. For this study, a total sidewalk zone width of 12' from the front face-of-curb has been assumed, providing a margin of safety of about 0.4'. Figure 1 illustrates what is considered here to be a minimum width sidewalk zone.

Driveway Crossings

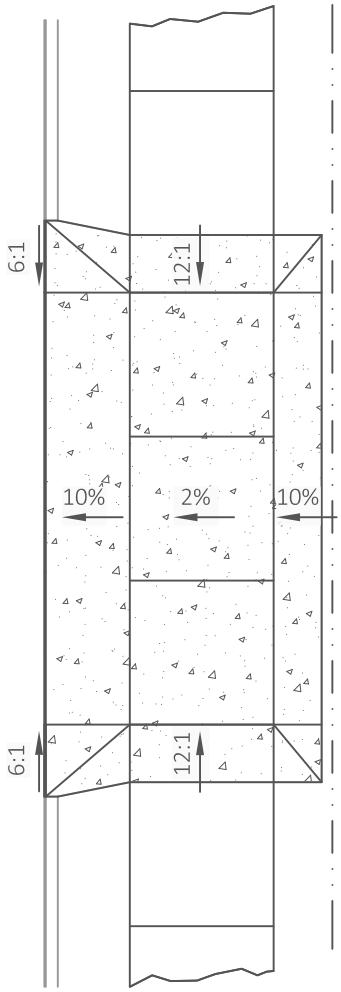
ADA and City standard place several restrictions on the geometrics of driveway crossings of sidewalks:

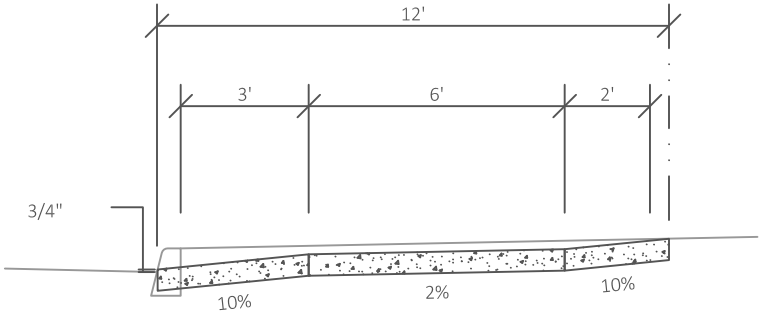
1. The maximum longitudinal slope of the sidewalk allowed is 12:1 (for short distances).
2. The maximum sidewalk cross slope is 2%.
3. The minimum sidewalk width is 6' (pedestrian travel zone).
4. The maximum driveway longitudinal slope from arterial roadways is 10%.

Applying the maximum slopes and minimum widths noted above allows for the driveway to rise 0.72' through the 12' sidewalk zone. This is equivalent to a 6" curb and 2% back slope over the 12' width. Figure 1 also illustrates this driveway crossing.



Minimum Sidewalk Zone per ADA and
City Requirements





Minimum Driveway Crossing per ADA
and City Requirements

Figure 1.
Minimum Sidewalk Zone and Driveway Configurations

The Concept of "Physical Setback"

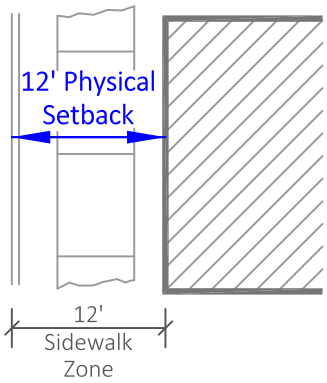
The term "physical setback" is used here refers to the distance between the curb of the roadway and the face of an existing building or its front sidewalk if one exists. This term should not be confused with the setback of the building face from the front property line established by zoning and other requirements. The existing physical setback, referred to here as the "Physical Setback Available", has been measured for each building from topographic and existing right-of-way survey performed earlier in this project.

The "Physical Setback Needed" is the distance between an existing structure and the existing curb needed to accommodate the new sidewalk and any additional space required for access and parking within the property.

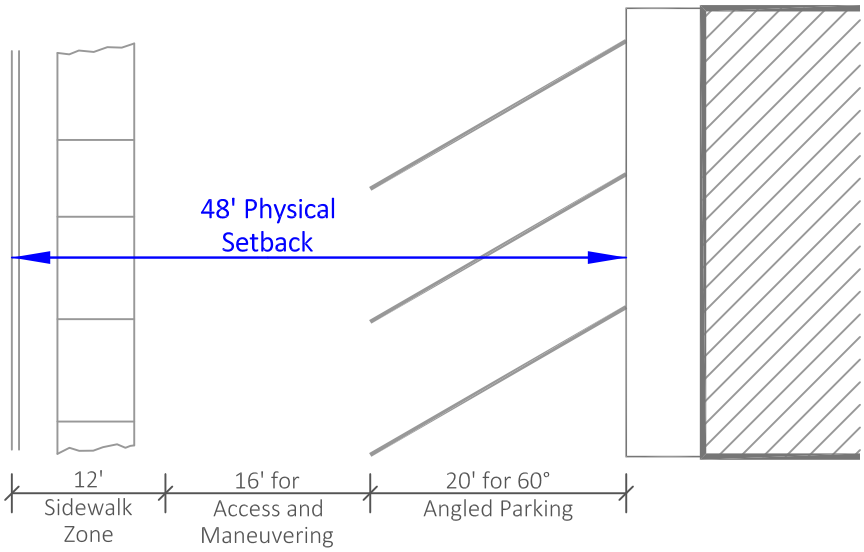
There are three general cases that apply to parcels fronting Broadway:

1. The first is parcels with no front parking. The physical setback needed width is simply the 12'width of the sidewalk zone.
2. The second involves parcels with front parking angled at 60°. The depth needed for the parking spaces (measured perpendicularly) is 20'. Additionally, a 16' "aisle" is needed for access and maneuvering. With a 12' wide sidewalk zone, the physical setback needed is 48'.
3. The third case involves parcels with 90° (perpendicular) front parking. In that case, 18' of depth is needed for the parking space and 24' for access and maneuvering. With the 12' wide sidewalk zone, a physical setback needed width of 54' is required to keep the existing parking operable.

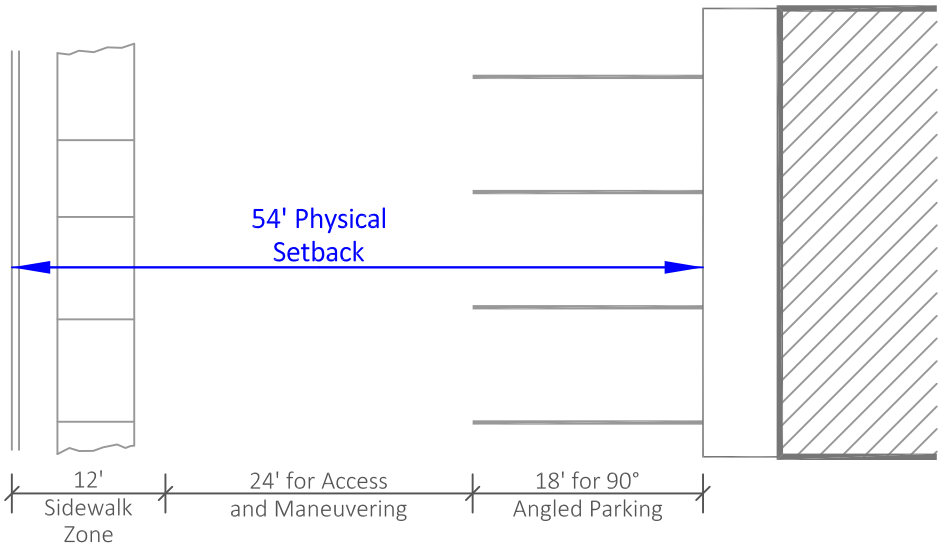
Figure 2 illustrates these cases.



Case 1: No Front Parking



Case 2: 60° Angled Front Parking



Case 3: 90° Angled Front Parking

Figure 2.
Three Cases of Physical Setbacks

Full vs. Partial Acquisitions

As described earlier, full acquisition of a parcel is assumed in cases where the sidewalk improvements would either extend into the building or displace existing parking critical to its viability. Specific conditions considered here to trigger full acquisitions are as follows:

1. Acquisition of parcels that do not depend on front or side parking is assumed only if the 12' sidewalk zone extended into the actual footprint of the building. The width of any existing sidewalk belonging to the building can be incorporated into the 12' sidewalk zone.
2. Acquisition of parcels that do depend on front parking is triggered if the physical setback needed to maintain the current parking situation exceeds the physical setback available. In such cases, the total of the width of the sidewalk zone plus that needed for parking and access would extend into the existing physical improvements, the private sidewalk at the front of the building where one exists or the face of the building where not. The width of an existing sidewalk cannot in this case be included in the sidewalk zone since it would be separated from the building by the parking/access area.
3. Several parcels have side parking that would extend into the sidewalk zone. Those that are clearly under-parked at the present time are considered to be total acquisitions if a substantial portion of its existing parking would be lost. The parcel at 1099 E. Broadway (as seen in Attachment 1 as discussed later) is an example of this. Parcels that would lose relatively few spaces and are not likely become unviable as a result are not considered to be full acquisitions. The parcel at 2419 E. Broadway (Attachment 13) is an example this situation.

The first two conditions are similar and are determined as the measured physical setback available being less than the physical setback needed. The third is determined by examination of aerial photos.

It is stated here again that for the purpose of this report, only loss of existing parking and access are used for assessing the extent of impact on properties. While these may be the predominant issue for this section of Broadway, other criteria can result in full acquisitions as discussed earlier.

Additional right-of-way will also be required from a number of parcels that will not result in substantial loss of parking and the resulting loss of function. These partial acquisitions have been identified and the width of right-of-way required at its widest point determined.

The data and processes used to identify full and partial acquisitions are presented in the attached block-by-block drawings and the analysis spreadsheet described next.

City-Owned Parcels

Parcels previously acquired by the City have not been included in this analysis. Those are shaded in blue in the various drawings and tables throughout this report.

Historic Status

Historic status of buildings along the project was determined by a detailed survey conducted earlier in the project. Those results are used here to assess the historic status of total acquisitions. Historic status is identified in later tabulations and attached drawings by the color of shading and/or the numerical designation as shown in Table1.

Table 1. Key to Historic Status Designations

Current District Contributors	1
Eligible as District Contributor	2
Individually Eligible	3
Architecturally Significant (Future Eligible)	4
Not Historically or Architecturally Significant	--

Block-by-Block Drawings

Attached to this report are separate drawings of each block of Broadway between Park and Martin Avenues, and between Norris and Eastbourne Avenues. The blocks between Euclid and Park and those immediately adjacent to Campbell Avenue and Country Club Road do not contain parcels likely to be impacted by a sidewalk widening project and have not been included.

The attachments are aerial photos on which property lines, addresses, and historic status of existing structures are shown. Also shown are the distances used to determine the physical setback available (lines and text in yellow), and a red line behind the existing curb representing the extent of the 12' sidewalk zone. Parcels crosshatched in yellow are those determined here as being full acquisitions. Those crosshatched in blue have been previously acquired by the City.

Analysis -- Spreadsheet

The spreadsheet provided in the appendix tabulates the analysis performed here. The columns of that table and, where applicable how they are derived, are as described here:

1. Identifies each parcel by address.
2. Indicates the historic status per Table 1.
3. The "Curb to Building/Sidewalk" is measured from earlier topographic surveys and mapping. Front sidewalks where they exist are considered a part of the structure. Otherwise the face of the building is used. This reflects the space on the parcel currently available for parking and access, and is in fact the "Physical Setback Available" described above and repeated in column 10.
4. The "Curb Face to Right-of-Way" is a measure of right-of-way currently existing behind the curb. It is used to ascertain the width of any right-of-way that would need to be acquired to construct the sidewalk improvements including from fully acquired parcels. Excess right-of-way would result in those cases.
5. "Sidewalk Zone Width" is the width needed to accommodate the new sidewalk system. The spreadsheet has been set up so that alternative widths can be easily evaluated, either universally or block-by-block. As described earlier, 12' is the minimum width considered viable here and the appendix reflects that value. Other widths are also checked however for reasons discussed later in this report.
6. "Front Parking?" indicates the parking that currently exists. A value of 90° indicates the present of straight-in or perpendicular parking and 60° indicates angled parking of that amount. No entry indicates that no front parking exists.
7. "Parking/Access Width" is the width that needs to be available at the front of the parcel beyond the new sidewalk to maintain the type of front parking that currently exists. As described earlier, this width is 36' for 60° parking and 42' for 90° parking.
8. "Side Parking Lost?" indicates the loss of sufficient other-than-front parking to likely render the parcel unviable. In such cases, total acquisition of the parcel is assumed.
9. "Physical Setback Needed" is the sum of the "Sidewalk Zone Width" of column 5 and the "Parking/Access Width" of column 7. Together they indicate the space needed at the front of the parcel needed to accommodate the new sidewalk while preserving the type of front parking that currently exists.
10. "Physical Setback Available" is the "Curb Face to Right-of-Way" distance of column 3. It is repeated here for easy comparison to column 9. When the amount needed exceed the amount available, a total acquisition is assumed.

11. “Full Acquisition?” is “yes” if a total acquisition is indicated either by the physical setback available being less than that needed, or if enough side parking is lost that the parcel is likely to become unviable.
12. “Historic Status” is indicated for historic properties fully acquired in accordance with the designations noted in Table 1. This is used to tabulate the numbers of historic properties acquired by historic status.
13. “2014 FCV” is the latest assessor’s full cash value and is listed for parcels identified as full acquisitions under various sidewalk zone width scenarios That value is used to estimate the cost of the acquisition as described below.
14. “Acquisition Cost” for parcels to be fully acquired. As discussed below, this estimate is developed by multiplying full cash value by a factor that accounts for relocation costs and any discrepancy between full cash value and the appraised value developed for acquisition purposes.

[Note: A much more extensive evaluation process based on appraisal data and regulatory acquisition practices will be used in the evaluation of street configuration alternatives and ultimately the acquisition process itself. While the process used here is approximate, it can be completed much more quickly and less expensively. It is intended to provide a general sense of the cost likely to be encountered.]

15. “Additional Right-of-Way Width” shows the width of the right-of-way actually needed for the new sidewalk system. This is shown for both full and partial acquisitions though in the case of full acquisitions excess right-of-way would be available.

Study Findings

The results of this study are tabulated in the appendix and summarized here in Table 2. Figure 3 shows the parcels determined here as subject to total acquisition crosshatched in yellow. That is also the case in the more detailed attachments.

It can be seen that the 12'-wide sidewalk zone would result in an estimate of 57 full acquisitions. Of those, 47 would involve structures that are either current or eligible historic district contributors. Partial right-of-way takes would be necessary from 47 additional parcels. Also shown in Table 2 are a preliminary estimate of relocation costs and the effect of varying the sidewalk zone width as discussed below.

Table 2. Summary of Results

Width of sidewalk zone:	12'	9'	20'
Full Acquisitions			
North Side:	20	20	27
South Side:	37	32	42
Total:	57	52	69
Change:	--	-8.8%	21.1%
Partial Acquisitions			
North Side:	26	24	22
South Side:	21	20	29
Total:	47	44	51
Change:	--	-6.4%	8.5%
Historic Full Acquisitions			
Current Contributors (North):	4	4	4
Current Contributors (South):	--	--	--
Eligible Contributors (North):	13	13	15
Current Contributors (South):	30	25	34
Individually Eligible (North):	--	--	1
Individually Eligible (South):	--	--	--
Total:	47	42	53
Change:	--	-10.6%	12.8%
Cost of Full Acquisitions ($Millions) *			
North Side:	5.3	6.3	8.0
South Side:	15.2	13.5	16.5
Total:	20.6	19.8	24.5
Change:	--	-3.8%	19.1%

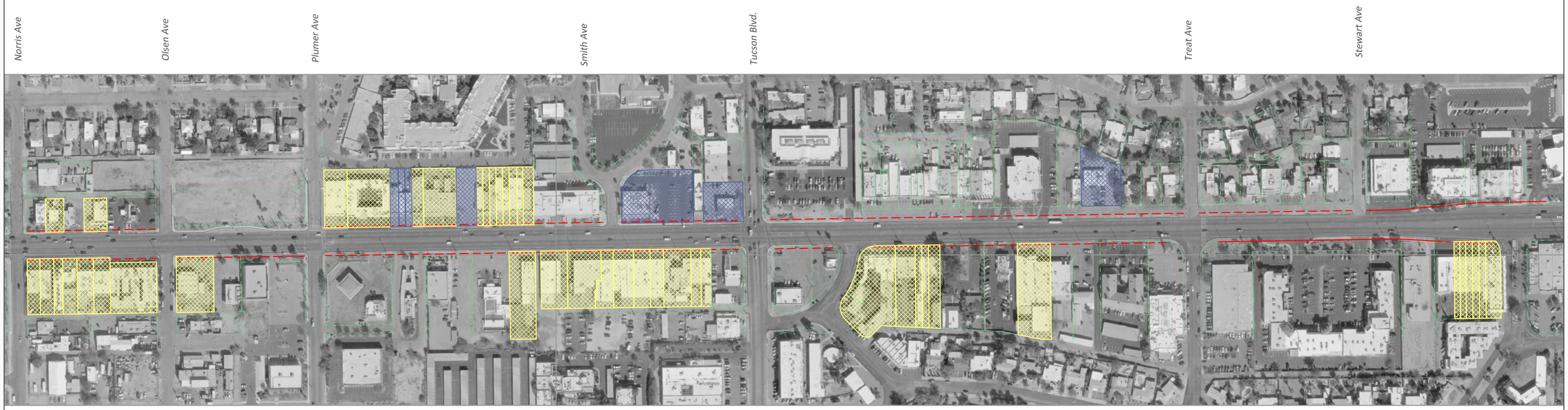
*Acquisition costs are estimated based on publically available assessor data for the purpose of this analysis only.

1" = 300'

12' Sidewalk Zone
Likely Full Acquisitions
City-Owned Property

Figure 3a. Parcels Subject to Full Acquisition
Park to Martin

1" = 300'



12' Sidewalk Zone
Likely Full Acquisitions
City-Owned Property

Figure 3b. Parcels Subject to Full Acquisition
Norris to Eastbourne

Acquisition Cost Estimate

An assessment of the cost likely to be involved in the property acquisition has been made based on the 2014 tax year full cash values (FCVs) of parcels to be fully acquired. The FCV is intended to reflect actual market value but can lag current conditions. Acquisition costs also include relocation of occupants and clearing the site of improvements prior to construction.

To provide some sense of what the acquisition costs are likely to be, a multiplier of 1.5 has been applied to the FCVs. That results in a cost of $20.6 million. Multipliers of 1.25 and 1.75 produce a range of $17.1 to $24.0 million. Given the approximations made in reaching this result, a range such as this should be considered for planning purposes.

This cost information is also included in Table 2. No estimate of cost for partial takes has been made.

Sensitivity of Sidewalk Zone Width

Additional analyses have been made to determine the sensitivity of these results on sidewalk zone width. The first is based on a 9' sidewalk zone to determine what benefits might be realized through the use of a substandard width. Those results, also seen in Table 2, show that the narrower zone would reduce the number of full acquisitions by 5 or about 9%. The number of historic properties acquired would be reduced by 3, about 6%. The estimated cost would be reduced by about $0.8 million, about 4%.

A similar analysis has been performed using a 20' sidewalk zone width. The purpose of this is to determine the effect on cost and acquisitions implications of a facility more conducive to suitable pedestrian and commercial environments. Those results, also provided in Table 2, indicate that the number of total acquisitions would be increased by 8 or about 21%. The number of historic properties fully acquired would increase by 4 or approximately 9%. The acquisition cost would increase $3.9 million, about 19%.

Implications of Not Constructing Broadway

Any significant expenditure of public funding on Broadway will require bringing the corridor into compliance with ADA requirements. Simply overlaying the existing pavement, for example, would trigger sidewalk construction. The costs and impacts of sidewalk construction determined here need to be anticipated as future maintenance costs if the Broadway project is not completed first.