

VII

Implementation

1. INTENT

Adoption of the Volcano Heights Plan will satisfy an important land use regulatory requirement for making available more than 3,400 acres for the future growth of the Albuquerque urban area. Development of the Volcano Heights Area as envisioned in this Plan is expected to result in approximately 12,000 additional housing units, 30,000 residents, 5 million square feet of non-residential building containing 18,000 jobs. The total growth in the Albuquerque market is approximately 5,500 residential units and 7,000 new jobs per year. Since Volcano Heights is only a portion of the inventory of developable land, it is reasonable to expect build-out there to occur over a number of years. The challenges involved with implementing the financial vehicles (Public Improvement Districts / Special Assessment Districts, Tax Increment for Development District) and the attendant planning and engineering projects that are needed to develop the Volcano Heights area will take some years to put in place. Lastly, master plan infrastructure (e.g. roadways, water and wastewater systems) required for the build-out of Volcano Heights are yet to be included in capital plans and their financing determined. The difficulties in a situation involving developing an area over 3,500 in size with more than 1,400 property owners according to adopted City land use policies are significant and cannot be expected to be resolved easily or quickly.

City Ordinance, in Section 14-13-1-1 ROA 1994, states that the “Planned Growth Strategy [PGS] report found that the Albuquerque area faces critical challenges related to...timely provision of infrastructure, parks, schools, and other facilities to support new development.” Section 14-13-2-3 states: “The Planned Growth Strategy, in conjunction with the Albuquerque / Bernalillo County Comprehensive Plan, shall guide the future development of the Albuquerque urban area. The Planned Growth Strategy shall serve as the comprehensive guide for this urban growth management program....” PGS Bill No. F/S R-02-111(A) (Enactment No. 112-2002) identifies Adequate Public Facilities regulations as an approach to insure that facilities, such as streets, water, wastewater, hydrology, parks, and schools, are available in a timely way to support new development. This legislation states that “Adequate infrastructure and facility regulations shall be established through a future Adequate Public Facilities Ordinance (APFO)”. Adequate Public Facilities regulations are a planning tool to phase and time urban growth.

The Volcano Heights Plan contains a number of recommendations related to open space; parks; natural, or “prudent line,” treatment of the arroyo drainage system;

expanding the buffer of the Petroglyph National Monument at the Escarpment edge; and so on, that call for recommendations regarding acquisition and funding.

The Volcano Heights Plan, as a Sector Plan, contains a number of regulations related to land use and zoning, urban design, roadway location and design, open space, landscaping, and so on. The Volcano Heights Plan attempts to set these standards at a level of specification appropriate for the size and scale of the Plan Area. Procedures for more refined development plan review and approval are needed that allow speedy review when consistent with the Volcano Heights Plan standards but also provide for flexibility to amend the regulatory requirements.

2. APPLICABLE REGULATIONS AND STANDARDS

The regulations and standards contained in the Volcano Heights Sector Development Plan, when there is any inconsistency with other City regulations and standards, take precedence over those other City regulations and standards and shall be effective in the Volcano Heights Plan Area.

3. GROWTH PHASING AND TIMING

(See **Exhibit 37, Phasing Diagram**)

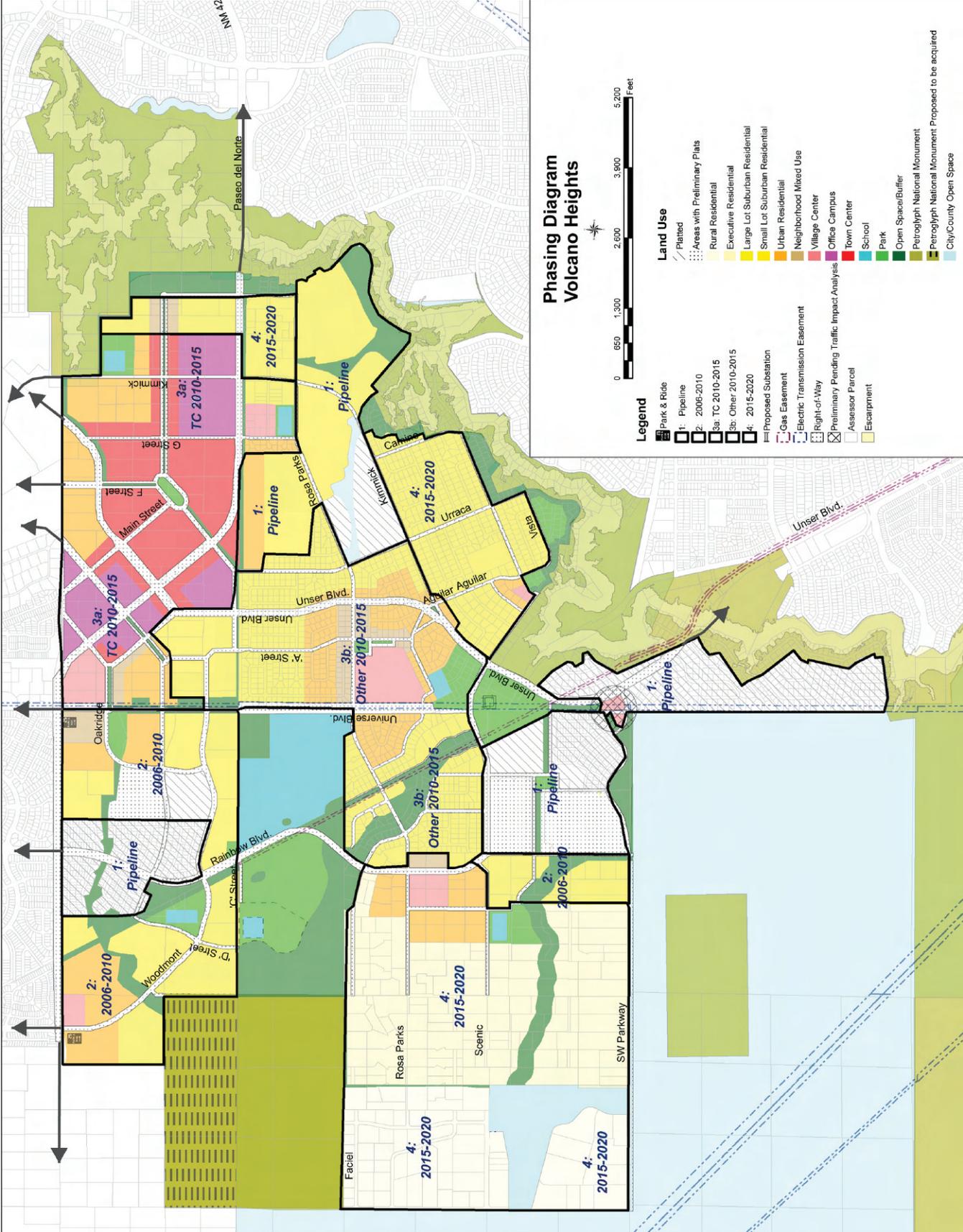
It would be neither financially prudent nor wise to assume that development may take place in all parts of Volcano Heights concurrently. Growth does occur when a number of conditions are met, many of which have to do with the provision of infrastructure. In the past, the public sector has responded to requests from developers for facility capacity. Planned Growth Strategy Town Hall participants, however, said that they “wanted a different, more intentional approach to growth that is not reactive or piecemeal but follows carefully considered principles that are developed with a high degree of community involvement. The community needs to be more proactive...” In the Volcano Heights Plan this direction is translated into a plan for the desired phasing and timing of growth.

The plan for phasing and timing of growth contains five categories:

1. Pipeline projects
2. Near Term: 2006 to 2010
- 3.a Town Center: 2010 to 2015
- 3.b. Other: 2010 to 2015
4. 2015 to 2020 and beyond.

The considerations for the various phases of growth assigned to Plan subareas generally include the following:

- pipeline projects exempted from the Volcano Heights moratorium with pre-existing final plat approvals;
- the indefinite phasing and financing of the expansion of master plan water and sewer service by the Albuquerque Bernalillo County Water Authority to Pressure Zones 3WR/4W and then to 5W, and the intent that the financing of these facilities be based on the “no net cost” rule;



Phasing Diagram
Volcano Heights



- Legend**
- Park & Ride
 - 1: Pipeline
 - 2: 2006-2010
 - 3a: TC 2010-2015
 - 3b: Other 2010-2015
 - 4: 2015-2020
 - Proposed Substation
 - Gas Easement
 - Electric Transmission Easement
 - Right-of-Way
 - Preliminary Pending Traffic Impact Analysis
 - Assessor Parcel
 - Escarpment
- Land Use**
- Platted
 - Areas with Preliminary Plats
 - Rural Residential
 - Executive Residential
 - Large Lot Suburban Residential
 - Small Lot Suburban Residential
 - Urban Residential
 - Neighborhood Mixed Use
 - Village Center
 - Office Campus
 - Town Center
 - School
 - Park
 - Open Space/Buffer
 - Petroglyph National Monument
 - Petroglyph National Monument Proposed to be acquired
 - City/County Open Space

Exhibit 37

- completion of Public Improvement Districts and/or Special Assessment Districts that will be necessary to design, finance and construct locally serving infrastructure;
- response to fast-track development of the Albuquerque Public Schools Volcano Heights high school;
- unitary ownership of land by Longford Homes and in the area just west of Vista Vieja;
- the desirability of allowing non-residential development to proceed at pace with or ahead of (in the case of the region-serving Town Center) residential development in order to secure the benefits of positive jobs-housing balance and reduce vehicular trips;
- implementation of a proposed Tax Increment for Development District in order to provide necessary infrastructure to serve the Town Center and Village Centers especially, such as parking structures, the urban boulevard, streetscape improvements, and so on.

Planned Roadway Improvements. Phasing of roadway improvements, based on the inclusion of roadways in approved plans and programmed funding, provides a critical context in Volcano Heights for the phasing and timing of development and needed implementation mechanisms.

The status of roadway improvements is as follows:

- Unser north to Atrisco, west on Atrisco, and north on Universe to the Plan Area boundary, and Paseo del Norte west of Universe are carrying traffic at this time;
- The following projects will be completed within a year
 - Paseo del Norte from the Escarpment west to Universe (2 lanes);
 - Unser north of Atrisco to Kimmick and Kimmick east to toward Paseo del Norte;
 - Rainbow south from Paseo del Norte to the new public high school;
- Unser from Kimmick north to the Plan Area boundary will be completed as a two lane roadway in 2009;
- Paseo del Norte from the Escarpment to Universe will be completed as 4 lanes in 2011;
- Rainbow from the new high school access to Unser has not yet been scheduled.

It will be necessary to identify sources of right-of-way, street, and streetscape funding / dedications / contributions-in-aid to implement the roadway network identified in the Transportation Section of the Volcano Heights Sector Development Plan.

Growth Phasing. The phasing of growth contained in **Exhibit 37, Phasing Diagram** is straight-forward. Near term development (Pipeline and 2006 to 2010) reflects unitary ownership and projects that already have some level of City development approval. The Town Center and area around the Volcano Cliffs Village Center are scheduled for the next

development phase: 2010 to 2015. It is expected that approximately 4 years will be required to set up the PID, SAD, and TIDD mechanisms that are needed for these developments to occur. It shall be possible for private contributions-in-aid to be made for necessary improvement in advance of this schedule. Nothing herein shall be interpreted as a prohibition against developing commercial uses in the Town Centers prior to 2010. The last phase of development, 2015 to 2020 and beyond includes properties that have multiple owners, that are more distant from the center of other development phases, require the construction of new master plan water and wastewater facilities, or about the Escarpment. PIDs / SADs are needed to develop these areas additionally.

Economic Development. The Volcano Heights Sector Development Plan contains many of the features of the Mesa del Sol Plan being prepared by Calthorpe and Associates for the N.M. State Land Office. However an important difference is that there is not unitary property ownership in Volcano Heights and special effort must be taken to promote the vision of the area to local and national developers. While it is expected that the property owners will be responsible for this effort, it is recommended that the City Office of Economic Development provide critical assistance.

4. IMPLEMENTATION MECHANISMS: PID, SAD, TIDD, WORKFORCE HOUSING, AND PUBLIC-PRIVATE PARTNERSHIPS

The Volcano Heights Sector Development Plan both requires and benefits from the use of special planning, engineering, and financing mechanisms known as Public Improvement Districts (PIDs), Special Assessment Districts (SADs), and Tax Increment for Development Districts (TIDDs). PIDs and SADs are needed where there is a “pre-mature” subdivision plat; in other words, where land received final plat approval and was sold to individual buyers before local, subdivision infrastructure was financed and installed. This practice currently would be illegal. PIDs and SADs are needed to remedy this situation.

Public Infrastructure Districts. In the past, Volcano Cliffs owners have taken advantage of the SAD mechanism to provide infrastructure within the SAD 227 area. SADs still are viable mechanisms for installing local infrastructure. The more recently enhanced Public Improvement Districts (Section 5-11-1 through 27 NMSA 1978) provide a more flexible mechanism for achieving the purposes of SADs and go beyond these applications. PIDs are established to create a special property tax assessment, over the normally charged rate, to fund the development of: street and parking facilities, trails, parks, open space, recreational facilities, landscaping, public building, schools sites and facilities, libraries and other educational and cultural facilities, water and wastewater systems, storm drainage, private utilities, as so on as provided in the Statute. While current City Ordinance requires a unanimous vote of all property owners to establish a PID, the State Statutory requirement is for three-fourths affirmative votes of District property owners cast, with the number of votes based on the acreage held of each owner.

It is strongly recommended that Public Infrastructure District be used in Volcano Heights instead of Special Assessment Districts in order to obtain the benefits of the

additional flexibility provided in PIDs. This will require an amendment of the City Ordinance provisions.

SADs and PIDs Needed. Exhibit 38, *Public Improvement District / Special Assessment District* indicates the need for creating five PIDs/SADs. This recommendation should be viewed in relation to the Growth Phasing Diagram above. Based on conversations with professional staff who have worked on SAD 227 in the Area, an organizing principle is formed to establish similar interests among the property owners included within each District. In other words, some Districts should contain low density residential zoning while others would include higher density, mixed use areas.

PID/SAD 1-A (low density residential zoning) and 1B (higher density, mixed use zoning) are located in the area surrounding the Volcano Cliffs Village Center. Both these areas are scheduled for development between 2010 and 2015. PID/SAD 2-A (low density residential zoning) and 2-B (higher density, mixed use zoning) are located further west and are scheduled for development between 2015 and 2020. SAD/PID 3 (containing mostly low density residential development but with a small village center) also is scheduled for 2015 to 2020 and afterwards.

Beyond the usual purposes for these PIDs, off-site benefits should be established for Unser Blvd and Rainbow Blvd especially and property tax assessment be included to assist with the development of these facilities.

For PID/SADs 1-A, 1-B, 2-A, 2-B, and the portion of 3 excluding the Rural Residential area, either a PID or an SAD, or the assembly of a minimum of 100 acres, is required as a condition of development. Planning and engineering drawings for the PID/SAD and the assembled tract shall indicate, among other things, topography, drainage easements, and the location of Development Envelopes. A PID/SAD may be required for the portion of PID/SAD Area 3 within the Rural Residential area.

Tax Increment for Development District (TIDD). TIDDs were approved by the 2006 New Mexico State legislature, provisions for which are included in Section 5-15-1 through 27 NMSA 1978. TIDDs have both property tax and gross receipts tax and revenue sources. Rather than creating in new tax, TIDDs capture a proportion of the increase in property and/or gross receipts tax revenue that occurs as a result of the area's development. The purposes to which these revenues can be used are broad and similar to those for a PID. In addition, TIDD revenue can be used for maintenance of infrastructure and facilities. The TIDD election requirement is a simple majority of votes cast with the number of votes based on the acreage held of each property owner in the District. The City has not as yet adopted in implementing Ordinance and this would be necessary to establish a TIDD in Volcano Heights.

Exhibit 39, Tax Increment for Development District contains the Volcano Heights Sector Development Plan's recommendation for creating one TIDD within the mixed-use portions of the Town Center and the Village Centers. This is suggested because the larger portion of TIDD revenues is expected from gross receipt taxes and these zones will generate the more of these revenues.

Revenue from the TIDD shall be used for critical elements of the Plan, without which revenue these improvements might never be constructed. These include, but are not limited to: the urban boulevard within the Town Center; parking structures, other roadway improvements not being funded by the City especially special design elements in

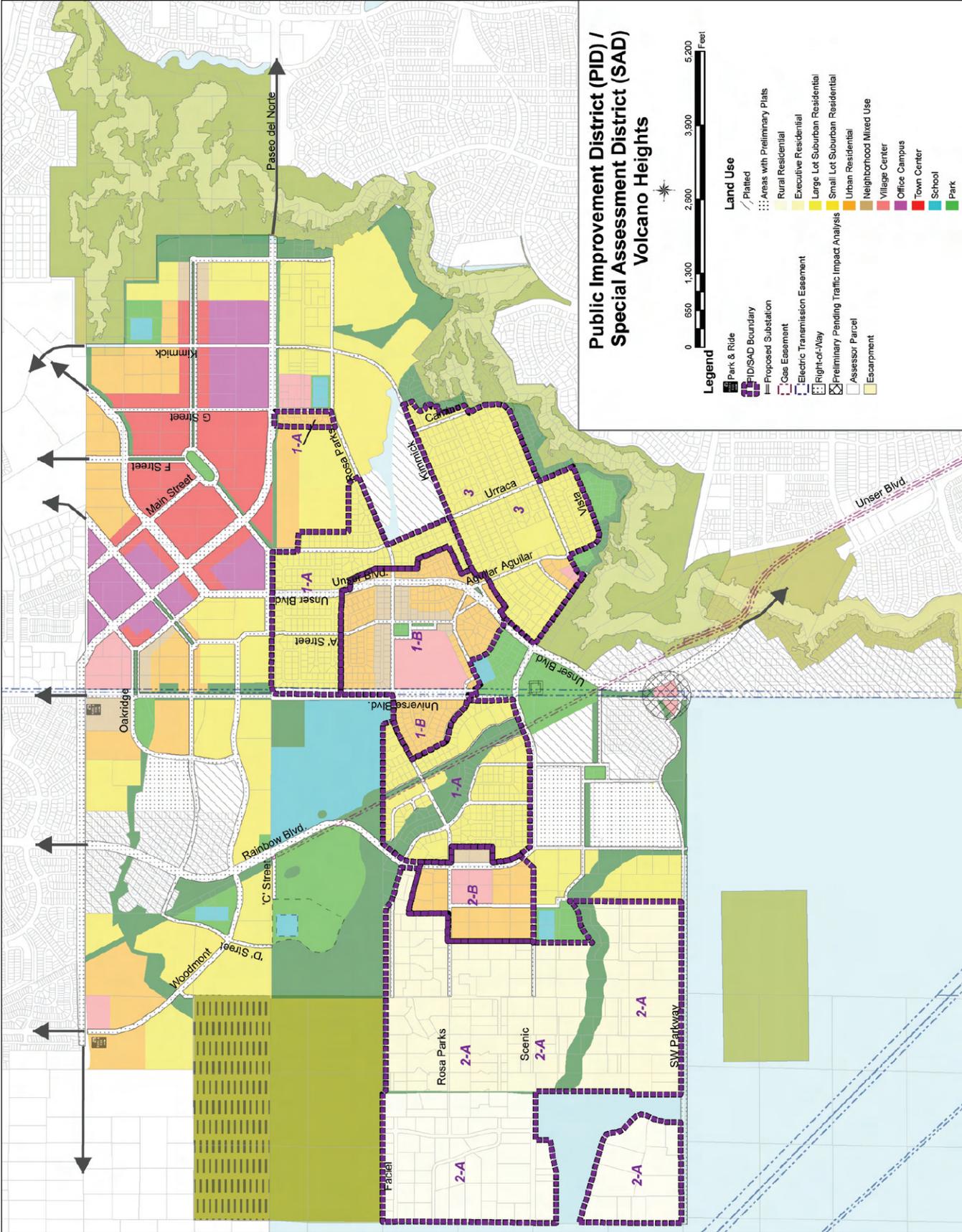


Exhibit 38

the Village Centers; plazas, pedestrian malls, and trails within and adjacent to the Town Center and Village Centers; streetscape improvement in these locations; parks including linear parks; BRT (transit) stations and related roadway improvements; and for the upkeep and maintenance of these infrastructure and facilities.

Because TIDDs earmark existing City property and gross receipts tax revenues, the tax increment adopted for Volcano Heights shall only be the excess above that needed to cover the normal capital and operating costs associated with the development in Volcano Heights.

Workforce Housing. One of the goals of the Workforce Housing Act is to create diverse communities. A number of financial and regulatory mechanisms are available in the City to assist in reaching this goal in Volcano Heights. These include, but are not limited to, waivers of City impact fees for affordable housing units in Planned Village Development Zones, affordable housing in adopted Centers and Corridors, and in mixed-income projects, affordable housing tax credits, and gap financing to achieve housing affordability using Federal, State, and Local funding sources.

Public-Private Partnership. It is recognized that there are many challenges involved in implementing the Volcano Heights Sector Development Plan due principally to the high development standards and to the multiple ownership of parcels in critical locations such as the core of Villages and the Town Center. Overcoming these challenges will involve close and cooperative working relationships among the City, the private sector, and others.

5. ADEQUATE PUBLIC FACILITIES

The City of Albuquerque shall establish Adequate Public Facilities (APF) regulations with regard to school facilities and transportation infrastructure capacity in the Volcano Heights Area. This will require a formal intergovernmental agreement with the Albuquerque Public Schools.

The purposes of Adequate Public Facilities regulations are:

- To link the provision of transportation and school facilities and services with the type, amount, density, rate, and timing of development;
- To manage new growth so that it does not outpace the provision of transportation and school facilities and services according to level of service standards;
- To coordinate public facility and infrastructure construction;
- To discourage sprawl and leapfrog development;
- To encourage the types of development that incorporate the community building and design principles contained in the Volcano Heights Plan.

In order to implement Adequate Public Facilities standards for schools and transportation infrastructure in the Volcano Heights Area, the following determinations will need to be made:

- The areas and subareas within Volcano Heights to which the transportation and school facility capacity standards apply. This is addressed below regarding elementary schools.

- The service standards for school facilities and transportation infrastructure to be applied. The Mid Region Council of Governments uses Level of Service (LOS) “D” for roadway budgeting purposes. Transportation modeling performed for this Plan indicates LOS conditions at “E” and “F” at intersections on Paseo del Norte and Unser under development build-out (with little difference between scenarios). Therefore, while not suggesting modification of the current, general LOS D standard, the suggested applicable LOS for Volcano Heights is “E” for transportation. An important policy issue related to schools is the “lag time” between the construction of residences and the availability of public facilities to serve the development. In order to address this issue, the City and County should consider the experience of other local government where they allow an average enrollment-to-capacity level for schools of 130%.
- Current and projected transportation and schools facilities in the Volcano Heights Area as contained in the City’s CIP, the MRCOG Metropolitan Transportation Plan (MTP), and the APS Facilities Master Plan. These capital planning documents must be consistent with the phasing and timing of development called for here.
- The juncture in the development approval process where the adequacy of roadway and school capacity must to be determined.
- Methods for reserving roadway and school capacity for approved development proposals.

Linking Residential Development Approval to School Facilities

Appropriate school locations are shown on the Land Use Plan. To meet current needs, APS planning and design for the new high school is well underway. The middle school that is shown on the Land Use Plan will be needed to meet demand generated from both Volcano Heights and from areas outside of the planning area. Both the high school and middle school are located on land that is currently owned by the State of New Mexico. As noted, the new Volcano Heights high school addresses current demand and an additional high school will be needed for the projected population of the Plan Area. Until this second high school is constructed, the new high school under development will prioritize the needs of existing residents.

The Land Use Plan shows five elementary schools. The number of schools is based on student generation rates typical of suburban areas and APS school size standards. Importantly, the number of elementary schools shown is based on the minimum average density requirements, which is consistent with current market trends. If market support for dense housing was to increase appreciably, an additional elementary school might be needed.

The locations for elementary schools are based on a number of factors including access, proximity to trails, and adjacency to Village Centers and the Town Center (without displacing dense urban uses that can take best advantage of transit and conveniences contained in these Centers).

Exhibit 40, *Elementary Schools and Service Areas at Build Out*, shows planned schools based on the build-out of the Area. The order the schools are recommended to

be built is identified within the school symbol on the map. Each of the service areas shown will generate enough students to fill one elementary school of about 650 students. The service areas have been configured to minimize the number of students who must cross limited-access arterials to get to school.

Based upon the Phasing Diagram, as shown in **Exhibit 41, *Elementary Schools and Service Areas Initial Phase***, Woodmont Elementary and Rosa Parks Elementary would be built first, and would serve projects that have already been entitled (The Trails, La Cuentista, Vista Vieja and SAD 227), as well as the next phase of housing built.

As the number of students generated in all of these areas combined may exceed the capacity of two elementary schools, it is likely that the next phase of school construction would include Aguilar Elementary as shown in **Exhibit 42, *Elementary Schools and Service Areas Intermediate Phase***.

Demand for Rainbow Elementary and Kimmick Elementary is likely to emerge later and concurrently with the Town Center area and development in the western portion of the Plan Area.

It is important to recognize that the Elementary School and Service Area diagram is a guide that must be integrated into the APS facilities master plan and funding program.

The boundary areas of the elementary schools and the phasing of their development shall be used to organize residential development in Volcano Heights. The City of Albuquerque already has adopted policy contained in Bill No. F/S R-05-297 which set the following regulation: “The approval of residential subdivisions and zone changes to residential or higher density residential zoning should only be allowed through careful consideration...and when APS has provided a viable solution for affected schools”. This has been replaced with the following policy language in Bill No. F/S R-06-74: “All preliminary plats and final plats approved after October 31, 2006 involving residential lots, single-family or multi-family residential land use, must evidence that APS has reviewed the proposal and determined that it is consistent by APS in accordance with a Pre-Development Facility Fee Agreement. No preliminary or final plat approval will be granted by the City for any subdivision containing any residential component without the determination by APS that the proposal has been reviewed and is consistent with the APS requirement that a Pre-Development Facilities Fee Agreement has been entered into between APS and the developer.” Enactment No. R-2005-177 (F/S R-05-297) was repealed in F/S R-06-74. Therefore, the City has an Adequate Public Facilities regulation related to the capacity of school facilities.

It is recommended that the City APS regulations be implemented through the following steps:

- APS produces a school facilities Capital Improvement Program that contains school Level of Service (LOS) standards addressing such issues as enrollment capacity at different school levels, facilities, number of students per classroom, and so on.
- The plan for new schools must be integrated with the City of Albuquerque’s Comprehensive Plan and the Planned Growth Strategy. More specifically, the schools Capital Program shall:

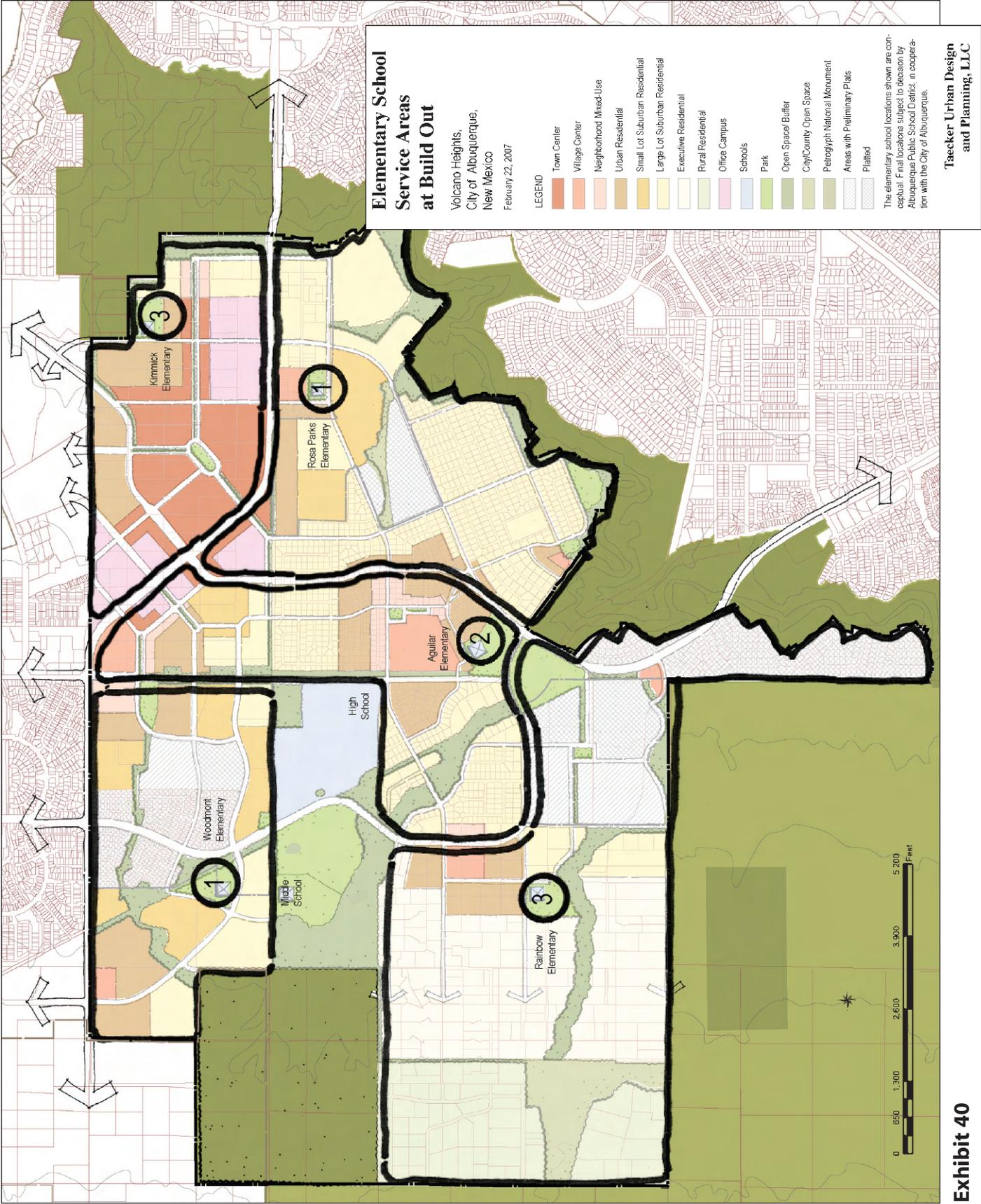


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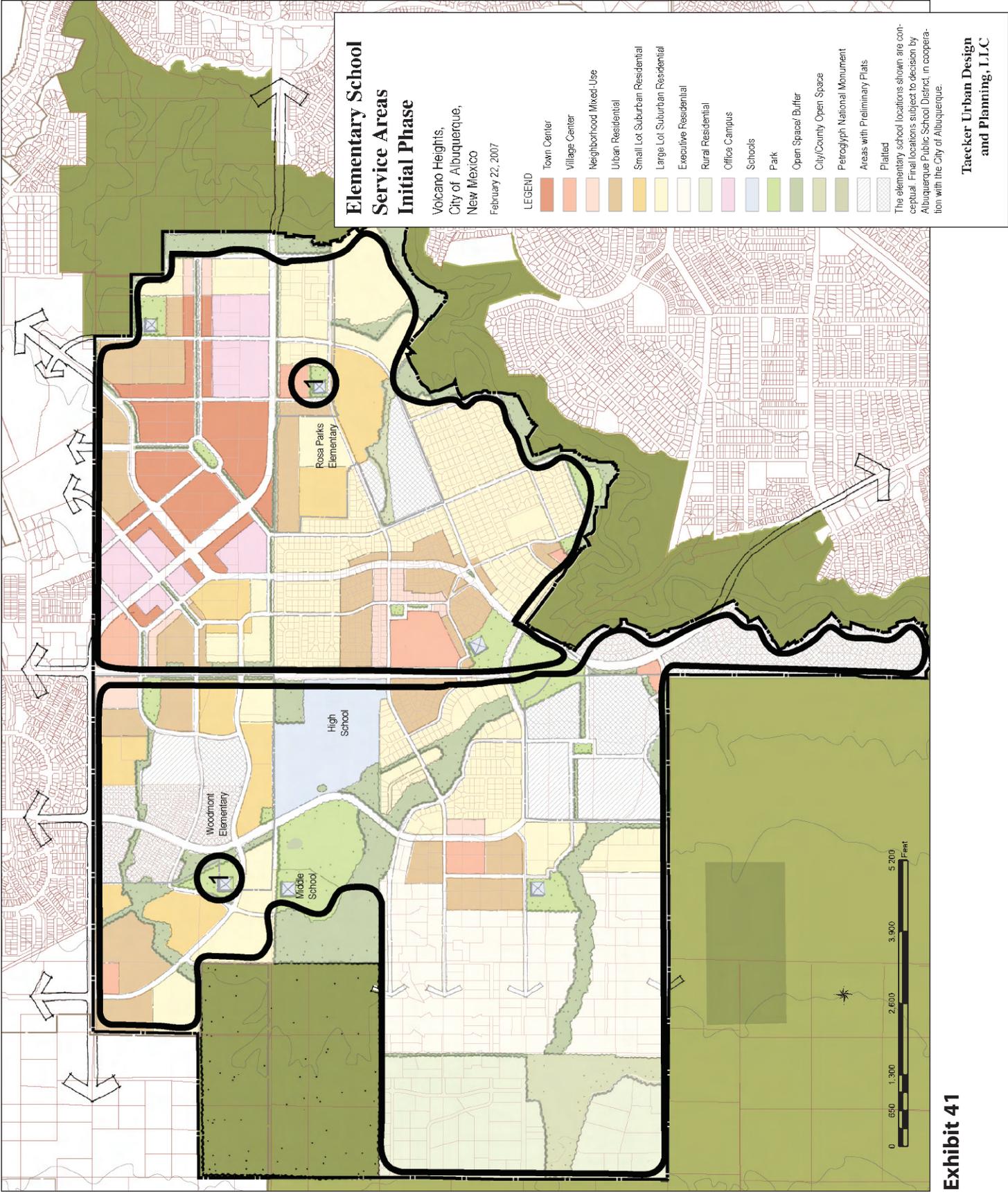


Exhibit 41

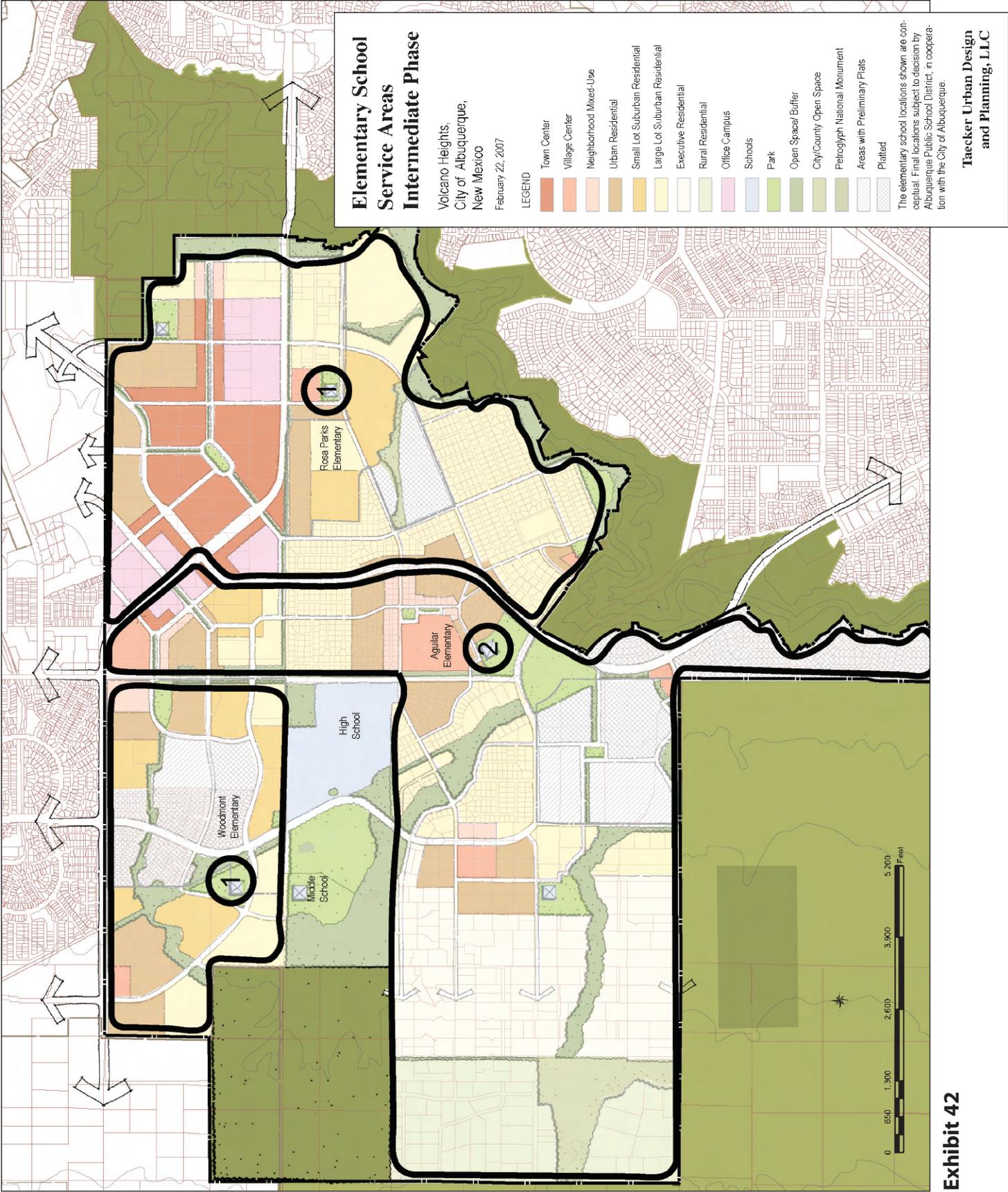


Exhibit 42

- Be coordinated with the City’s adopted Land Use Assumptions for growth (which Assumptions must be modified by the City to incorporate the Volcano Heights Plan);
- Establish the demographic relationship between new residential construction and the number of students contained within the households in these new structures both at the time of occupancy and over time.
- The APS school facilities Capital Improvement Program shall identify the schools contained in the Volcano Heights Plan, reflect their Plan location and boundary area, enrollment, number of households served, cost, and time frame in which they are planned to be constructed consistent with the Volcano Heights Plan phasing and timing assumptions.
- It is recognized that the Albuquerque Public Schools does not have sufficient financial resources to construct school facilities to meet the current demand. The school facilities Capital Improvement Program shall allocate a percent of total cost (or its equivalent dollar value) to each school that shall be met by (a) Albuquerque Public Schools’ property tax revenues, and (b) other financial sources such as voluntary developer contributions, State of New Mexico grants, and so on.
- When the City receives a request for approval of a subdivision, or site plan for residential development, or zone change to residential or higher density residential, the City shall provide a conditional approval that becomes effective when the Albuquerque Public Schools certifies in writing, by referring to the standards identified above, that area schools will timely be available to meet the demand created by a specific new development. It is suggested that the final solicitation / assembly of resources from public sources and developers occur when approximately 50% of the residences within the school boundary area appropriate for the time period, sufficient to provide the student base for a new school have received conditional approval from the City.
- The Albuquerque Public Schools must have reasonable assurance of sufficient present and future revenues from guaranteed sources to build the new school facilities prior to certifying in writing that area schools will timely be available.

Consequently, residential development will be “stacked” by elementary school boundary areas until the proximate number of residence to be built to supply the students for a new school have received conditional City approval. APS then will authorize development activities to build the school and the homes will be permitted by the City. Students requiring school space in advance of new facilities will be handled by somewhat exceeding design capacity at existing, nearby schools. As a result, residential development will be phased and timed consistent with the urban growth management program.

Linking Development to Roadway Capacity

The City of Albuquerque, together with the Mid Region Council of Governments (MRCOG), the Albuquerque Metropolitan Flood Control Authority, and the Albuquerque Bernalillo County Water Authority, provide a set of facilities and services needed to support new development, including water, wastewater, storm drainage, streets, parks, community center, libraries and so on.

The provision of these services will be coordinated in relation to the growth phasing and timing plan through City Adequate Public Facilities regulations and reviews related to roadways. The City of Albuquerque will organize the provision of these infrastructure items and services by its own agencies and others consistent with the growth plan. The critical link will be the opening of transportation capacity related to arterial and collector streets.

The APF system related to roadways will involve facility demand and capacity needs, which, in the Volcano Heights Area, will be based upon streets included in adopted capital programs that have an identified funding source and that will add capacity, the capacity required by development, and the timing of their construction.

It will be necessary to establish the administrative procedures for an Adequate Public Facilities system in order to fully implement the system within City government.

6. PARKS, OPEN SPACE, STORM DRAINAGE ACQUISITION

The Volcano Heights Plan (See “VI. Open Space”) provides a detailed specification of open space, parks, and storm drainage properties needed within the area. These properties were identified by location and market data on recent sales was obtained by the Planning Team. The table below contains this break-down by category together with total acreages and recommended responsibilities / funding sources for acquisition.

Table 15
Open Space, Parks and Drainage Funding

Location and Purpose	Estimated Acreage	Recommended Primary Funding Sources
<i>Open Space</i>		
Monument Buffer – South of Piedras Marcadas Area	28.0	Impact Fees / State of N.M. / U.S. Govt.
Monument Buffer – Piedras Marcadas	27.4	Impact Fees / State of N.M. / U.S. Govt.
Northern Portion of North Geologic Window – Petroglyph National Monument	121.0	City of Albuquerque Capital Improvement Program
State of N.M. Holdings – Archeological Sites and Open Space	82.6	City Open Space Trade Lands
<i>Parks</i>		
Co-located Park / School Sites	75.0	City Capital Improvement Program, PIDs, City Open Space Trade Lands
Parks Not Co-located with Schools	66.8	City Capital Improvement Program, PIDs, City Open Space Trade Lands
<i>Storm Drainage</i>		
North Boca Negra Arroyo	32.2	Impact Fees
Middle Boca Negra Arroyo	36.7	Impact Fees

The possible funding sources include development Impact Fees for Open Space and for Storm Drainage; the City’s Capital Improvement Program, City Open Space Trade Lands, Public Improvement Districts, and State of New Mexico and U.S. Government Capital Grants. It is assumed that the State of New Mexico may be willing to bear part of the cost of expanding the Escarpment edge of the Petroglyph National Monument

because of its national importance. It also is assumed that the City will bear the pre-existing responsibility for completing the acquisition of the North Geologic Window in Petroglyph National Monument.

The land to be acquired, funding sources, acreage, and current estimated costs are included in the following table.

Table 16
Land Acquisition
Funding Sources, Acreage, and Current Estimated Costs

Purpose and Funding Source	Estimated Acreage	Estimated Cost
<i>Open Space</i>		
Impact Fees/State of New Mexico/ U.S. Government	55.4	\$14.1 mm
City Capital Improvement Program	121.0	\$4.2 mm
City Open Space Trade Lands	82.6	Trade
<i>Parks & Co-located School Sites</i>		
City Capital Improvement Program PIDs, City Open Space Trade Lands	141.8	\$6.7 mm
<i>Storm Drainage</i>		
Impact Fees	68.9	\$3.1 mm

It should be noted that most of these dollar resources are unavailable at present. Impact fees are collected as building permits are pulled, relatively late in the development process. The recommended funding by the State of New Mexico and the U.S. Government is based on future legislative actions. Public Infrastructure Districts are not yet established. In turn, the City's experience with the acquisition of open space is that prices escalate significantly over time. It is recommended that the City acquire these properties ahead of development in the area. This may require advancing funds from public sources ahead of collections. Delay of purchases will result in much higher acquisition costs and, in turn, will alter the assumptions in the table above, possibly involving other greater dependence on sources of funds such as SAD assessments, Tax Increment for Development Districts, and Public Infrastructure Districts. It should be noted that once the zone changes on private properties are approved to these public purposes it is legally incumbent on the City to purchase the property.

7. DEVELOPMENT APPROVALS

It is intended that development reviews for plans that are consistent with the standards contained in the Volcano Heights Sector Plan be simplified.

The fragmentary ownership of land on most of the property approximately south of a line drawn along the north side of the State Land across the Plan area, however, will require more extensive planning efforts. Public Improvement Districts and Special Assessment Districts will be needed there to address such issues as locally serving streets, water and sewer, hydrology improvements, and platting. PID and SAD Plans should be integrated with broader master planning efforts to address the standards and incentives of this Plan such as subdivision of lots when allowed, Conservation Easements, Community Conservation Areas, Building Envelopes, architectural and landscaping standards, and so on.

Moreover, the coherence of the Town Center and the Village Center areas (also including Urban Residential, Office Campus, and Neighborhood Mixed Use zones adjacent to the centers) calls for a more fine-grained and integrated Master Development Plans.

“General plans” and “development plans” are required for the formation of PIDs and TIDDs.

The table below indicates the separate planning efforts recommended and the suggested review mechanism for these plans. These plans must be consistent with the Volcano Heights Sector Plan to qualify for expedited review as identified in the table.

Plans submitted that are inconsistent with the regulations contained in the Volcano Heights Sector Plan are subject to the Sector Plan amendment process.

**Table 17
Development Review**

Planning Area	Review Mechanism
Town Center (including Office Campus, Urban Residential, Neighborhood Mixed Use, Park and School Site Areas)	EPC & TIDD
Volcano Cliffs Village Center (including Neighborhood Mixed Use, Urban Residential, Park and School Site)	EPC & SAD, TIDD for Village Center
Universe Village (including Urban Residential)	Planning Director & TIDD
Rainbow Village (including Neighborhood Mixed Use and Urban Residential)	Planning Director & PID/ SAD, TIDD
Volcano Cliffs Lands (including Suburban Residential, Park and School site, Open Space, small Village Center and Urban Residential area, property located on the east and west side of the Volcano Cliffs Village Center)	Planning Director & PID/ SAD, TIDD for Village Center
Longford Homes Area (not including the Universe Village, but from Universe to the Plan boundary on the west and Woodmont Village)	Planning Director & TIDD for Village Center
Executive Residential Area	Planning Director & PID/SAD
Rural Residential Area	Planning Director & PID/SAD

8. AMENDMENTS TO EXISTING PLANS

The Volcano Heights Plan contains elements that require subsequent amendments to several adopted Plans and incorporation into future plans and programs. The elements of the Volcano Heights Plan, upon adoption by the City, are assumed to amend existing City Plans. City and other staff are encouraged to take the actions needed to incorporate these changes into the appropriate plans and programs.

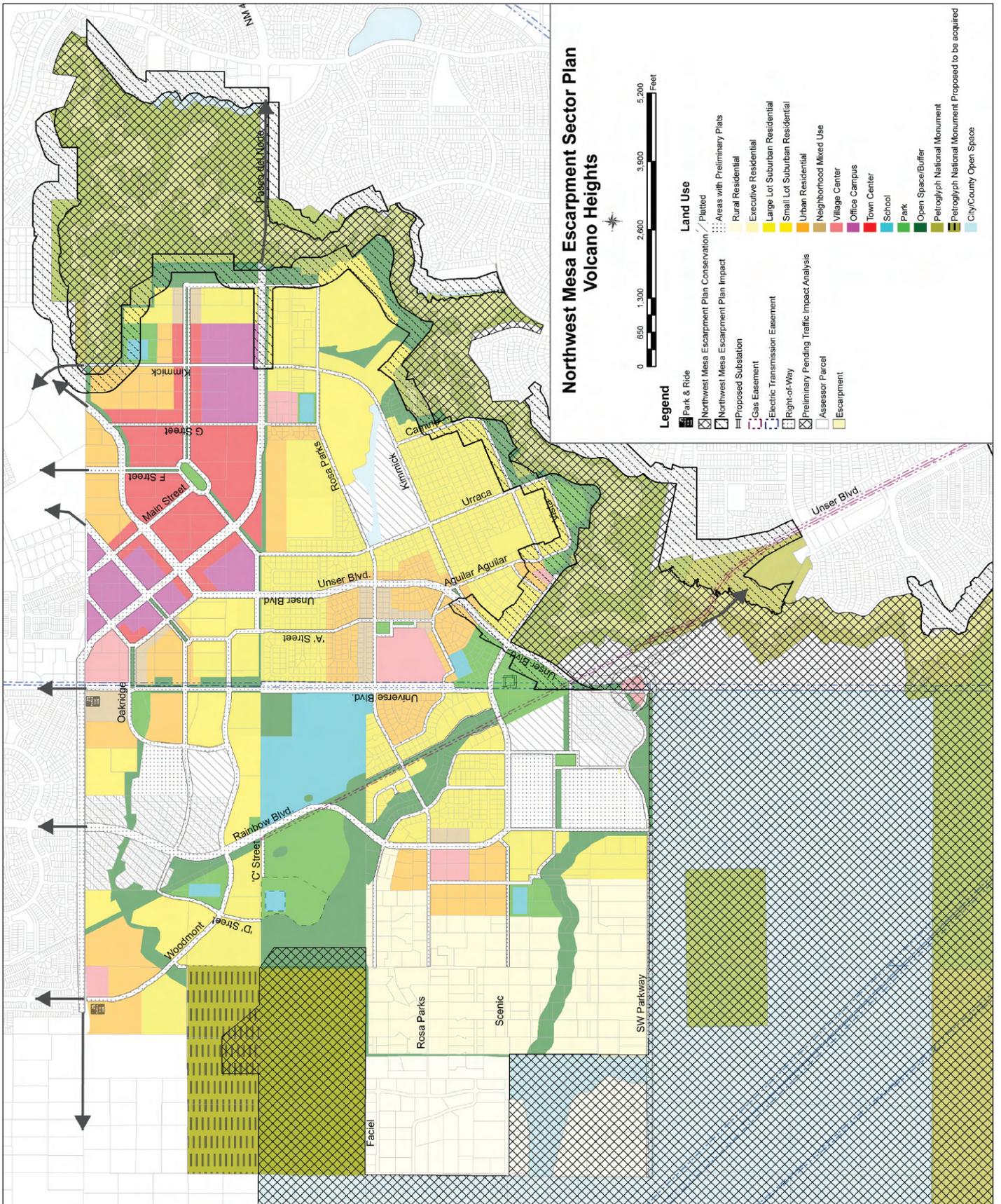
Affected are the following:

- Long Range Roadway System Plan,
- Long Range High Capacity Transit System Plan,
- Trails and Bikeways Plan,
- Unser Blvd Design Standards as contained in Bill No. F/S R-455, Enactment No. 169-1989,
- Policies prohibiting truck access on some arterials,
- PGS Land Use Assumptions,
- Impact Fee Component Capital Improvement Program,
- City of Albuquerque Capital Improvement Program,
- Service Area Boundaries and capital plan of the Albuquerque / Bernalillo County Water Authority,
- Albuquerque Public Schools Facilities Master Plan,
- Albuquerque / Bernalillo County Comprehensive Plan (Centers and Corridors) to include the Town Center as an Activity Center

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Appendix A



Appendix B

Approved Colors

Exterior color and reflectivity standards for residential areas

All of the illustrated colors have a “light reflective value” (LRV) within the range of 20% to 50% LRV rating and may be used in any residential area. Other colors may be submitted related to a specific site or more detailed plan, but they must have an LRV rating within this range. The material samples shown are of stucco with integrated color as required in the VHSDP.

Light and color work together. White reflects the radiant energy rays of the sun and black absorbs them. This principle has a significant impact on a house. Light colored reflective coatings are like a white shirt for a house and cut cooling costs. Dark colors are less reflective but can significantly increase the surface temperature of a wall. Finish coat colors with Light Reflective Values of 20% or lower are highly absorbent and will, in typical conditions, result in surface temperatures higher than acceptable sustained service temperature. Higher reflective values on external coatings reduce energy consumption and create higher performance buildings.

At the same time, the higher reflectivity value of lighter colors is a consideration for Volcano Heights because of the need to minimize the visual effect of development in the area on views from the rest of the city. In 1993 the High Desert Plan required an upper limit of 40% reflectivity. A balance between reflectivity and light absorption is recommended for Volcano Heights through a mid-range of color reflectivity.

The third consideration is the emphasis on the natural landscape in the VHSDP. The recommended colors are selected to be in harmony with the natural setting and at the same time provide choice in color selection.

VOLCANO HEIGHTS PLAN

APPROPRIATE COLORS from the Natural Landscape

for

BUILDINGS WITHIN RESIDENTIAL AREAS

LIGHT REFLECTANCE VALUES

Chart Color	LRV %	Chart Color	LRV %
122 Straw	41.83	135 Sahara	34.63
106 Buckskin	34.73	116 Adobe	24.03
118 Suede	37.67	124 Coral	34.93
117 Fawn	45.48	115 Cottonwood	32.18

LRV data is from El Rey Stucco; El Rey does not guarantee the LRV data provided. Colors are illustrative from El Rey Standard Color for Premium Stucco Finish. Color reproduction in this Plan is not an exact representation of the El Rey color chart.

In keeping with New Mexico tradition, accent colors on front doors, window sash, and other incidental elements is allowed as long as the accent color does not overwhelm the building's basic color or create a visual distraction from the adjacent streets, lots or public areas.

The color sample is for El Rey traditional cementitious stucco manufactured locally in Albuquerque. El Rey Premium Stucco Finish is a compound of cement, hydrated lime, sand aggregates and iron oxide pigments. Since the stucco is integrally colored it will never need to be painted. Like many natural landscapes, the traditional cement stucco is breathable and appears slightly different during each season and at alternate times of the day.

Other types of stucco with similar colors may be used, as long as they have integral color and meet the standards for reflectivity and harmony with the natural landscape.

Appendix C

Native Plant List A

List of Plant Species of Petroglyph National Monument - Plants found by Bleakly during a survey from August 1994 through September 1995. One hundred and ninety-two (192) plants from 40 families were identified. Arrangement is alphabetical by family, genus, and species with some synonyms and common names. An asterisk (*) before the name indicates plants listed in Barlow-Irlick (1993). Nomenclature according to Kartesz (1994). Common names from various sources. Number of species in each family are in parentheses after family name. A "pound sign" (#) indicates that a voucher is housed at the UNM Herbarium.

ADIANTACEAE Maidenhair Fern Family (1)

Cheilanthes feei T. Moore SLENDER LIPFERN #

AGAVACEAE Agave or Yucca Family (1)

Yucca glauca Nutt. SMALL SOAPWEED

AMARANTHACEAE Pigweed Family (3)

Amaranthus acanthochiton Sauer GREENSTRIPE #

Amaranthus wrightii S. Wats. WRIGHT'S AMARANTH #

Tidestromia lanuginosa (Nutt.) Standl. WOOLLY TIDESTROMIA

ANACARDIACEAE Sumac Family (1)

Rhus trilobata Nutt. SKUNKBUSH, SKUNKBUSH SUMAC

APIACEAE (=UMBELLIFERAE) Parsley or Carrot Family (1)

Cymopterus acaulis (Pursh) Raf. var. *fendleri* (Gray)

Goodrich (*Cymopterus fendleri* Gray) FENDLER SPRINGPARSLEY #

ASCLEPIADACEAE Milkweed Family (1)

Asclepias subverticillata (Gray) Vail WHORLED MILKWEED

ASTERACEAE (=COMPOSITAE) Sunflower Family (42)

Acourtia nana (Gray) Reveal & King (*Perezia nana* Gray) DWARF
DESERT HOLLY, DWARF DESERTPEONY #

Aphanostephus ramosissimus DC. PLAINS DOZEDAISY #

Artemisia bigelovii Gray BIGELOW'S SAGEBRUSH #

Artemisia filifolia Torr. SANDSAGE, SAND SAGEBRUSH

Artemisia frigida Willd. FRINGED SAGE

Artemisia ludoviciana Nutt. ssp. *albula* (Woot.) Keck WHITE SAGE-
BRUSH #

* *Bahia absinthifolia* Benth. #

* *Bahia dissecta* (Gray) Britt.

Bahia pedata Gray BLUNTSCALE BAHIA #

Baileya multiradiata Harvey & Gray ex Gray DESERT MARIGOLD #

* *Berlandiera lyrata* Benth.

Brickellia californica (Torr. & Gray) Gray CALIFORNIA BRICKELLBUSH #

Chaetopappa ericoides (Torr.) Nesom (*Leucelene ericoides* (Torr.) Greene)
WHITE ASTER

- * *Chrysothamnus nauseosus* (Pallas ex Pursh) Britt. ssp. *bigelovii* (Gray) Hall & Clements #
Chrysothamnus pulchellus (Gray) Greene ssp. *pulchellus*
 SOUTHWESTERN RABBITBRUSH #
Conyza canadensis (L.) Cronq. CANADIAN HORSEWEED
 * *Gaillardia pinnatifida* Torr. #
Gaillardia pulchella Foug. FIREWHEEL
Gutierrezia sarothrae (Pursh) Britt. & Rusby BROOM SNAKEWEED #
Helianthus petiolaris Nutt. PRAIRIE SUNFLOWER
Hymenopappus flavescens Gray var. *canotomentosus* Gray YELLOW-FLOW-
 ERED WHITE RAGWEED, COLLEGEFLOWER #
Machaeranthera canescens (Pursh) Gray HOARY TANSYASTER #
 * *Machaeranthera gracilis* (Nutt.) Shinnery (*Haplopappus gracilis* (Nutt.) Gray) #
Machaeranthera pinnatifida (Hook.) Shinnery (*Haplopappus spinulosus* (Pursh) DC.) LACY TANSYASTER
Malacothrix fendleri Gray FENDLER DESERTDANDELION #
Melampodium leucanthum Torr. & Gray PLAINS BLACKFOOT #
 * *Microseris* sp. *Palafoxia sphaelata* (Nutt. ex Torr.) Cory OTHAKE #
Parthenium incanum Kunth MARIOLA #
Pectis angustifolia Torr. var. *angustifolia* NARROWLEAF PECTIS #
Ptilostrophe tagetina (Nutt.) Greene WOOLLY PAPERFLOWER
Sanvitalia abertii Gray ABERT'S CREEPING ZINNIA #
Senecio flaccidus Less. var. *flaccidus* (*Senecio douglasii* DC. ssp. *longilobus* (Benth.) L. Benson THREADLEAF GROUNDSEL #
Senecio multicapitatus Greenm. ex Rydb. RAGWORT GROUNDSEL #
Senecio riddellii Torr. & Gray RIDDELL'S RAGWORT OR GROUNDSEL #
Stephanomeria pauciflora (Torr.) A. Nels. BROWNPLUME WIRELETTUCE #
Thelesperma megapotamicum (Spreng.) Kuntze HOPI TEA, GREENTHREAD
Thymophylla acerosa (DC.) Strother (*Dyssodia acerosa* DC.) PRICKLYLEAF DOGWEEED #
Verbesina encelioides (Cav.) Benth. & Hook. f ex Gray GOLDENCROWNBEARD, COWPEN DAISY
Xanthium strumarium L. COCKLEBUR
Zinnia grandifolia Nutt. ROCKY MOUNTAIN ZINNIA #

BIGNONIACEAE Bignonia Family (1)

Chilopsis linearis (Cav.) Sweet DESERT WILLOW

BORAGINACEAE Borage Family (4)

Cryptantha cinerea (Greene) Cronq. var. *cinerea* (*C. jamesii* Payson var. *multicaulis* (Torr.) Payson) JAMES' CATSEYE #

Cryptantha crassiseppala (Torr. & Gray) Greene var. *elachantha* I.M. Johnst. THICKSEPAL CATSEYE #

Heliotropium convolvulaceum (Nutt.) Gray PHLOX HELIOTROPE

Lappula occidentalis (S. Wats.) Greene var. *occidentalis* (*L. redowskii* (Hornem.) Greene) FLATSPINE STICKSEED #

BRASSICACEAE (=CRUCIFERAE) Mustard Family (7)

Descurainia pinnata (Walt.) Britt. WESTERN TANSYMUSTARD #

Dimorphocarpa wislizenii (*Dithyrea wislizenii*)

SPECTACLE POD; TOURISTPLANT

Lepidium lasiocarpum Nutt. var. *lasiocarpum* SHAGGYFRUIT
PEPPERWEED #

* *Lepidium montanum* Nutt.

Lesquerella fendleri (Gray) S. Wats. FENDLER BLADDERPOD #

CACTACEAE Cactus Family (6)

Echinocereus fendleri (Engelm.) F. Seitz PINKFLOWERED
HEDGEHOG CACTUS

Escobaria vivipara (Nutt.) Buxbaum (*Coryphantha vivipara* (Nutt.) Britt. &
Rose) SPINYSTAR

Opuntia clavata Engelm. CLUB CHOLLA

Opuntia imbricata (Haw.) DC. TREE or WALKINGSTICK CHOLLA

Opuntia phaeacantha Engelm. BROWNSPINE PRICKLYPEAR

Opuntia polyacantha Haw. PLAINS PRICKLYPEAR

CAPPARACEAE Caper Family (1)

Polanisia dodecandra (L.) DC. ssp. *trachysperma* (Torr. & Gray) Ilitis
SANDYSEED CLAMMYWEED #

CHENOPODIACEAE Goosefoot Family (5)

Atriplex canescens (Pursh) Nutt. FOURWING SALTBUCH

* *Chenopodium desiccatum* A. Nels. #

Chenopodium fremontii S. Wats. FREMONT'S GOOSEFOOT #

Krascheninnikovia lanata (Pursh) Guldenstaedt (*Ceratooides lanata* (Pursh)

J.T. Howell; *Eurotia lanata* (Pursh) Moq.) WINTERFAT

CUCURBITACEAE Gourd Family (1)

Cucurbita foetidissima Kunth COYOTE or MISSOURI GOURD

CUPRESSACEAE Cypress Family (1)

Juniperus monosperma (Engelm.) Sarg. ONESEED JUNIPER

EPHEDRACEAE Jointfir Family (1)

Ephedra torreyana S. Wats. TORREY JOINTFIR or MORMON TEA #

EUPHORBIACEAE Spurge Family (7)

Chamaesyce parryi (Engelm.) Rydb. PARRY'S SANDMAT or SPURGE #

Chamaesyce serpyllifolia (Pers.) Small THYMELEAF SANDMAT or
SPURGE #

Chamaesyce serrula (Engelm.) Woot. & Standl. SAWTOOTH SANDMAT
or SPURGE #

Croton texensis (Klotzsch) Muell.-Arg. TEXAS CROTON #

Euphorbia dentata Michx. TOOTHED SPURGE #

* *Tragia ambylodonta* (Muell.-Arg.) Pax & K. Hoffmann

Tragia ramosa Torr. BRANCHED NOSEBURN

FABACEAE (=LEGUMINOSAE) Bean or Pea Family (14)

Astragalus amphioxys Gray var. *amphioxys* CRESCENT MILKVETCH #

Astragalus ceramicus Sheld. var. *ceramicus* PAINTED MILKVETCH #

Astragalus lentiginosus Dougl. var. *diphysus* (Gray) Jones SPECKLEDPOD
MILKVETCH #

Astragalus nuttallianus DC. SMALLFLOWERED MILKVETCH #

Caesalpinia jamesii (Torr. & Gray) Fisher JAMES' HOLDBACK

Dalea compacta Spreng. var. *compacta* COMPACT PRAIRIECLOVER #

Dalea formosa Torr. FEATHERPLUME

Dalea lanata Spreng. var. *terminalis* (Jones) Barneby WOOLLY
PRAIRIECLOVER #

Dalea nana Torr. ex Gray var. *carnescens* Kearney & Peebles DWARF PRAIRIECLOVER #

Dalea scariosa S. Wats. (*Petalostemon scariosa* (S. Wats.) Wemple) ALBUQUERQUE PRAIRIECLOVER #

Hoffmannseggia glauca (Ortega) Eifert INDIAN RUSHPEA

Pedimelum hypogaeum (Nutt.) Rydb. (*Psoralea hypogaea* Nutt.) SCURFPEA #

Psoralea scoparius (Gray) Rydb. (*Dalea scoparia* Gray) BROOM DALEA; PURPLE SAG

FUMARIACEAE Fumitory Family (1)

Corydalis aurea Willd. GOLDEN CORYDALIS, SCRAMBLED EGGS, GOLDENSMOKE, BUTTER AND EGGS

GROSSULARIACEAE Gooseberry Family (1)

Ribes sp. GOOSEBERRY

HYDROPHYLLACEAE Waterleaf Family (4)

Nama hispidum Gray BRISTLY NAMA

Phacelia crenulata Torr. var. *crenulata* CLEFTLEAF WILDHELIOTROPE #

Phacelia integrifolia Torr. GYPSUM SCORPIONWEED #

Phacelia ivesiana Torr. IVES PHACELIA #

LINACEAE Flax Family (2)

Linum aristatum Engelm. BRISTLE FLAX

**Linum australe* Heller #

LOASACEAE Stickleaf Family (2)

Mentzelia albicaulis (Dougl.) Dougl. WHITESTEM BLAZINGSTAR

Mentzelia pumila (Nutt.) Torr. & Gray DWARF MENTZELIA #

MALVACEAE Mallow Family (5)

Sida abutilifolia P. Mill. (*Sida filicaulis* Torr. & Gray) SPREADING FANPETALS #

* *Sida neomexicana* Gray

Sphaeralcea angustifolia (Cav.) G. Don ssp. *lobata* (Woot.) Kearney COPPER GLOBEMALLOW #

Sphaeralcea hastulata Gray (*Sphaeralcea subhastata* Coult.) SPEAR GLOBEMALLOW #

Sphaeralcea incana Torr. ex Gray GRAY GLOBEMALLOW #

NYCTAGINACEAE Four O'clock Family (7)

Abronia fragrans Nutt. ex Hook. FRAGRANT WHITE SAND VERBENA

* *Allionia choyisia* Standl. #

Allionia incarnata L. TRAILING WINDMILLS #

Boerhavia spicata Choisy (*B. torreyana* (S. Wats.) Standl.) CREEPING SPIDERLING #

* *Mirabilis glabra* (S. Wats.) Standl. (*Oxybaphus glaber* S. Wats.) #

Mirabilis linearis (Pursh) Heimerl NARROWLEAF FOUR O'CLOCK

Selinocarpus diffusus Gray SPREADING MOONPOD #

OLEACEAE Olive Family (1)

Menodora scabra Gray ROUGH MENODORA

ONAGRACEAE Evening Primrose Family (2)

Gaura coccinea Nutt. ex Pursh SCARLET BEEBLOSSOM

Oenothera pallida Lindl. PALE EVENINGPRIMROSE #

OROBANCHACEAE Broomrape Family (1)

Orobanche ludoviciana Nutt. (*O. multiflora* Nutt.) LOUISIANA BROOMRAPE #

PEDALIACEAE Sesame Family (1)

Proboscidea louisianica (P. Mill.) Thelleng COMMON DEVILSCLAW,
DEVILSHORN, RAM'S HORN

PLANTAGINACEAE Plantain Family (1)

Plantago patagonica Jacq. (*P. purshii* Morris) WOOLLY PLANTAIN #
Plantago lanceolata L. NARROWLEAF PLANTAIN

POACEAE (=GRAMINAE) Grass Family (42)

Aristida adscensionis L. SIXWEEKS THREEAWN #

* *Aristida arizonica* Vasey

Aristida havardii Vasey HAVARD'S THREEAWN #

* *Aristida pansa* Woot. & Standl.

Aristida purpurea Nutt. var. *fendleriana* (Steud.) Vasey
FENDLER'S THREEAWN #

* *Aristida purpurea* Nutt. var. *neallyi* (Vasey) Allred #

* *Aristida purpurea* Nutt. var. *purpurea* #

* *Bothriochloa barbinodis* (Lag.) Herter #

Bothriochloa laguroides (DC.) Herter ssp. *torreyana* (Steud.) Allred & Gould
(*Andropogon saccharoides* Sw.) SILVER BEARDGRASS or SILVER
BLUESTEM #

Bouteloua aristoides (H.B.K.) Griseb. var. *aristoides* NEEDLE GRAMA #

Bouteloua barbata Lag. var. *barbata* SIXWEEKS GRAMA #

Bouteloua curtipendula (Michx.) Torr. SIDEOATS GRAMA

Bouteloua eriopoda (Torr.) Torr. BLACK GRAMA #

Bouteloua gracilis (Willd. ex Kunth) Lag. ex Griffiths BLUE GRAMA

Bouteloua hirsuta Lag. HAIRY GRAMA

* *Cenchrus carolinianus* Walt. (*Cenchrus incertus* M.A. Curtis)

* *Digitaria californica* (Benth.) Henr.#

Elymus elymoides (Raf.) Swezey (*Sitanion hystrix* (Nutt.) J.G. Sm.; *Elymus*
longifolius (J.G. Sm.) Gould) SQUIRRELTAIL #

Enneapogon desvauxii Beauv. NINEAWN PAPPUSGRASS #

Erioneuron pulchellum (Kunth) Tateoka (*Dasyochloa pulchella* (Kunth) Willd.
ex Rydb.) FLUFFGRASS, LOW WOOLLYGRASS #

Hilaria jamesii (Torr.) Benth. (*Pleuraphis jamesii* Torr.) GALLETA #

* *Koeleria macrantha* (Ledeb.) J.A. Schultes

(*Koeleria cristata* auct. p.p. non Pers.)

* *Lycurus phleoides* Kunth

Monroa squarrosa (Nutt.) Torr. (*Munroa squarrosa* (Nutt.) Torr.)
FALSE BUFFALOGRASS #

* *Muhlenbergia arenacea* (Buckl.) A.S. Hitchc.

Muhlenbergia arenicola Buckl. SAND MUHLY #

Muhlenbergia porteri Scribn. BUSH MUHLY #

Muhlenbergia pungens Thurb. SANDHILL MUHLY #

Muhlenbergia torreyi (Kunth) A.S. Hitchc. ex Bush RING MUHLY

Oryzopsis hymenoides (Roemer & J.A. Schultes)

Ricker ex Piper INDIAN RICEGRASS

* *Poa bigelovii* Vasey & Scribn.

Scleropogon brevifolius Phil. BURROGRASS #

Setaria leucopila (Scribn. & Merr.) K. Schum.
STREAMBED BRISTLEGRASS #

* *Setaria lutescens* (Weigel) F.T. Hubbard ?

Sporobolus contractus A.S. Hitchc. SPIKE DROPSEED
Sporobolus cryptandrus (Torr.) Gray SAND DROPSEED #
 * *Sporobolus flexuosus* (Thurb. ex Vasey) Rydb. #
Sporobolus giganteus Nash GIANT DROPSEED #
Stipa comata Trin & Rupr. var. *comata* NEEDLEANDTHREAD #
 * *Stipa neomexicana* (Thurb. ex Coult.) Scribn.
Stipa spartea Trin. PORCUPINEGRASS #
Vulpia octoflora (Walt.) Rydb. (*Festuca octoflora* Walt.)
 SIXWEEKS FESCUE #

POLEMONIACEAE Phlox Family (1)

Ipomopsis pumila (Nutt.) V. Grant DWARF GILIA #

POLYGONACEAE Knotweed Family (4)

Eriogonum abertianum Torr. var. *abertianum* ABERT BUCKWHEAT #
 * *Eriogonum effusum* Nutt.
Eriogonum polycladon Benth. SORREL BUCKWHEAT #
Eriogonum rotundifolium Benth. ROUNDEAF BUCKWHEAT #
Rumex hymenosepalus Torr. CANAIGRE; DOCK #

PORTULACACEAE Purslane Family (1)

Portulaca sp. PURSLANE

RANUNCULACEAE Crowfoot Family (1)

Delphinium sp. LARKSPUR

ROSACEAE Rose Family (1)

Fallugia paradoxa (D. Don) Endl. ex Torr. APACHE PLUME

SALICACEAE Willow Family

Salix sp. WILLOW

SCROPHULARIACEAE Figwort Family (3)

Epixiphium wislizenii (Engelm. ex Gray) Munz (*Maurandya wislizenii*
 Engelm. ex Gray) BALLOONBUSH #
Penstemon ambiguus Torr. GILIA PENSTEMON or BEARDTONGUE
 * *Penstemon* sp.

SOLANACEAE Potato Family (6)

Chamaesaracha coronopus (Dunal) Gray GREENLEAF FIVE EYES #
Datura innoxia P. Mill. THORNAPPLE; JIMSONWEED #
Lycium pallidum Miers PALE WOLFBERRY
Nicotiana trigonophylla Dunal DESERT TOBACCO #
Physalis acutifolia (Miers) Sandw. (*P. wrightii* Gray) SHARPLEAF
 GROUNDCHERRY #
Solanum elaeagnifolium Cav. SILVERLEAF NIGHTSHADE

VERBENACEAE Vervain Family (2)

Aloysia wrightii Heller ex Abrams WRIGHT'S BEEBRUSH #
 * *Tetradlea coulteri* Gray #

ZYGOPHYLLACEAE Caltrop Family (2)

Kallstroemia sp. CALTROP

Appendix D

Construction Mitigation

Policy CM: Any damage to the vegetation, slope, or placement of boulders due to or related to construction shall be mitigated as provided herein.

Policy CM-1: Prior to beginning construction, the property owner shall construct a temporary fence at the site boundary adjacent to the Escarpment Buffer, Major Open Space Area, archeological site or public or private conservation area to be maintained in natural desertscape to effectively barricade it from heavy equipment and vehicles. Photographs of the site in its original condition shall be submitted with the application for building permit, subdivision and/or site development plan.

Policy CM-2: Prior to beginning construction, the property owner shall construct a temporary fence at the Development Envelope boundary and at the parcel boundary (except for the interior lot lines of parcels developed at the same time) within the Rural Residential, Executive Residential, and Suburban Residential–Large Lot Zones to protect natural desertscape in the Conservation Easement area to effectively barricade it from heavy equipment and vehicles.

Policy CM-3: Public- and private-sector projects within the Conservation Area and the Impact Area facing the Escarpment and adjacent to archeological sites must include geotechnical data and analysis that demonstrates to the satisfaction of the City Engineer that proposed trenching or blasting will not affect the face of the Escarpment, potentially causing erosion or caving of the slopes and boulders and thereby threatening the public safety or welfare or otherwise damage archeological resources.

Policy CM-4: The following applies in the selection of alignment and in site design.

- a Grading plans shall demonstrate that cut and fill has been kept to a minimum consistent the standards in this Plan. Generally, the overall topography of the site is not to be substantially altered.
- b Minimum width of disturbance to slopes and vegetation and minimum cut and fill, balanced against the need to provide for bikeways or other amenities within the right-of-way.

Policy CM-5: Replacement of boulders shall be to the approximate the original location, angle and surface exposure. Revegetation to approximate original cover with appropriate native or naturalized plants as identified in Plant List A is required within 90 days of project completion. A variance may be granted if the type of vegetation or time of year make revegetation within 90 days impossible. For infrastructure projects on public lands, the construction company shall post a warranty bond effective for three years after completion of the infrastructure work to insure successful revegetation.

Policy CM-6: The City shall be responsible for restoring existing damaged areas which lie within public open space. The property owner shall be responsible for restoring damaged areas on lands accepted by the City to meet open space requirements if that damage occurred after the adoption of the Volcano Heights Sector Development Plan; this shall occur prior to title transfer if the land is to be deeded to the City, and shall be an ongoing responsibility of the property owner if the land remains private open space.

Policy CM-7 Existing cuts which are used as trail locations shall be stabilized and revegetated at the time of trail construction.

Policy CM-8: As public open space is acquired by the City, damaged areas shall be protected from further abuse and reseeded.

Appendix E

Stormwater Design and Management Standards

The 300 foot drainage corridor of the North and Middle Forks of the Boca Negra Arroyos shall remain as undisturbed desert with natural vegetation, rock formations, and drainageway intact. Only minimal alterations are permissible if essential for stormwater management or for the initial construction of a trail or recreational amenity.

Policy SDM-1: Channel treatments shall meet the following requirements:

Limited stabilization of natural channels, according to the policies contained in the “Facility Plan for Arroyos,” unless such treatment is determined to be infeasible by the City or the Albuquerque Metropolitan Flood Control Authority as appropriate.

Use of many small, unobtrusive structures, such as check dams or small drop structures, rather than larger, more obtrusive structures, when structural solutions are required.

Use of materials in treated channels which blend visually with the escarpment and adjacent open space. Naturalistic treatments, such as rip-rap, gabions, or tinted concrete, are the preferred treatment types.

Protection of canyons from erosion through control of developed flows and through stabilization techniques which are consistent with the visual character of the open space.

Policy SDM-2: Developed flows shall be managed to minimize their impact on the open space, North Geologic Window, archeological sites, and the Escarpment Face. The potential impacts of water retention should be thoroughly studied prior to use of detention areas to control flows.

Policy SDM-3: Within the large areas of open space, developed flows shall be modified through check dams or other means to approximate undeveloped flows to minimize impacts on the escarpment and to minimize the intensity of channel treatment required. However, the impact of check dams as a method of controlling flows should be thoroughly studied prior to their use.

Appendix F

DEFINITION: QUALIFIED ARCHAEOLOGIST:

(This definition remains in affect until superceded by future adopted City Ordinance.)

An individual who meets the following minimum professional standards:

1. a graduate degree in archeology, anthropology, or closely related field, or equivalent training acceptable for accreditation purposes by the Society of professional Archeologists; and
2. demonstrated ability to carry research to completion, evidenced by timely completion of theses, research reports or similar documents; and
3. at least 16 months of professional experience and/or specialized training in archeological field research, laboratory research, administration or management, including at least 1 year of experience or specialized training in the kind of activity the individual proposes to practice, and at least 6 months of field experience within the region where the project will be undertaken, or demonstrable competence based on analogous experience. Persons engaged to do archival or documentary research, as part of the permitted activity, should have either a graduate degree in history or ethnohistory or at least two years of graduate education in either of these fields, or equivalent professional experience including publications.”

Appendix G



Kimley-Horn
and Associates, Inc.

MEMORANDUM

Date: April 25, 2006

To: Lou Colombo, City of Albuquerque
Matt Taecker, Taecker Urban Design and Planning

From: James M. Daisa, P.E.

Subject: Volcano Heights Concept Plan – Traffic Operations Assessment and Boulevard Design Recommendations

This memorandum summarizes the methodology and conclusions of a traffic operations analysis and boulevard design study for the proposed Town Center area of the Volcano Heights Concept Plan. The objectives of this study are:

- Review the proposed boulevard design on Paseo del Norte and provide design assessment and recommendations, and
- Determine if the proposed signalized intersection spacing (1/4 mile) in the Town Center would degrade traffic operations below conditions with standard spacing (1/2 mile).

This memorandum is divided into two section 1) boulevard design recommendations, and 2) a summary of the traffic operations analysis.

Paseo del Norte Boulevard Design Assessment and Recommendations

The Concept Plan proposes that Paseo del Norte within the Town Center be designed as a “boulevard” in the traditional sense. A traditional boulevard is a concept that combines a high-capacity thoroughfare with pedestrian-oriented frontages that encourage street activity. This is accomplished by providing one-way frontage roads parallel to the arterial street separated by a median with breaks that allow access to/from the arterial and frontage roads. The frontage roads serve fronting buildings, and provide on-street parking, ample landscaping, and a pedestrian environment buffered from the higher speed traffic by the frontage road itself. This concept has raised concerns about its affect on the traffic operations and safety of Paseo del Norte, specifically:

- Traffic turning into and out of the frontage road will create friction that interferes with the flow of through traffic on Paseo del Norte;
- Traffic turning out of the frontage road will attempt to weave across multiple lanes of Paseo del Norte to access the northbound left turn lanes creating a safety hazard; and
- Traffic slowing down to turn into the frontage road will create congestion and the potential for rear-end collisions.



There are several ways that the boulevard can be designed to mitigate these concerns, which are discussed below.

Description of the Boulevard

The design of the Paseo del Norte Boulevard is illustrated in **Figure 1**, which provides a plan view of the Town Center. The boulevard section of Paseo del Norte is located between the intersections of Woodmont and Unser Boulevard, with one-way frontage roads in both directions parallel to Paseo del Norte. Each frontage road is accessed internally within the adjacent block by local streets, as well as through openings in the raised median separating the frontage road from Paseo del Norte.

The median openings offer access to passing traffic on Paseo del Norte. Although the frontage roads wrap around the Unser Boulevard side of the blocks, direct access to the frontage roads is not provided from Unser, except for a right-turn slip ramp south of the Paseo del Norte/Unser intersection (see Figure 1). The northbound frontage road can be accessed via internal streets, from Woodmont Road via an intersection set back a minimum of 150 feet from Paseo del Norte, and from two median openings on Paseo del Norte. The southbound frontage road can be accessed from the right-turn slip ramp on Unser Boulevard, internal streets, two median breaks on Paseo del Norte and has egress to Woodmont Road.

Figure 2 illustrates the detail of the frontage road design between Woodmont and Unser Boulevard, focusing on the design of the median openings. The proposed design utilizes a continuous right turn lane in which traffic can use to decelerate when entering the frontage road and to accelerate when exiting the frontage road. Traffic exiting the frontage road can then weave into the through lanes on Paseo del Norte, or remain in the right turn lane and turn at Unser Boulevard.

Design Recommendations for Paseo del Norte Boulevard Segment

- The frontage road intersections with Woodmont Road (in each direction) should be located a minimum of 150 feet from the intersection of Woodmont with Paseo del Norte.
- The beginning of the continuous right turn lane should accommodate a 340 foot long deceleration length (for 45 mph) which can include a 100 foot long taper length.
- The northern median opening in the northbound direction (the opening closest to Unser Boulevard) should only allow right turns into the frontage road. This eliminates traffic turning out into the operational area of the Paseo del Norte/Unser intersection and avoids driver attempts at weaving across multiple lanes of travel to access the northbound left turn lanes.
- The second median opening in each direction should be located a minimum of 250 feet upstream from Unser Boulevard and Woodmont Road (500 feet is proposed) to provide storage length in the continuous right turn lane to accommodate right turn queues at these intersections.



- Recommended posted speed limit on Paseo del Norte and Unser Boulevard through the Town Center area is 35 mph.

Design Recommendations for Concept Plan Area Network

Figure 3 illustrates the recommended intersection lane configurations, control, and number of through lanes for the Concept Plan area. **Figures 4 through 8** illustrate roadway cross-sections for Paseo del Norte and Unser Boulevards at various locations. **Figure 4** illustrates the boulevard segment of Paseo del Norte. **Figure 5** illustrates Paseo del Norte with exclusive bus lanes. The section in **Figure 6** illustrates several sections of Paseo del Norte and Unser Boulevards as either 6 lanes (without exclusive bus lanes) or 4 lanes (with exclusive bus lanes). The section in **Figure 7** illustrates the section of Unser Boulevard with a northbound access lane (located between Woodmont and Paseo del Norte). The section in **Figure 8** illustrates the typical section of Unser Boulevard through the escarpment as it enters the plan area. This section has been revised to accommodate the proposed exclusive BRT lanes.

Options for Pedestrian Access Across Paseo del Norte/Unser Boulevard Intersection

The design recommendations presented above and operations analysis described below assume an at-grade intersection at Paseo del Norte and Unser Boulevards. Because of high traffic volumes this intersection requires multiple through and turning lanes resulting in a large intersection with very long pedestrian crossings. In addition, two “free-right” turn lanes shown in **Figure 3** (lanes that allow a free flow of right turning traffic without signal control) result in a pedestrian barrier when there are high volumes of right turns as in the peak period.

Pedestrian are required to cross 112 feet of travel lanes on Paseo del Norte excluding the center median (which should be a minimum of 8 feet to serve as a refuge island for slower pedestrians). Unser Boulevard requires a 78 foot crossing excluding a pedestrian refuge. On the approaches which require free right turn lanes pedestrian are required to cross an uncontrolled lane of traffic. Intersections of this size are not uncommon, but are a barrier to pedestrian travel due to real and perceived exposure to moving traffic. Additionally, the required signal timing to accommodate pedestrians can significantly reduce traffic capacity. Options to accommodate pedestrians include:

- 1) Provide conventional at-grade pedestrian crossings on all four approaches as described above. Provide pedestrian signal head (with countdown timers) and pedestrian pushbuttons. Provide a minimum 6 foot wide (preferable 8 foot wide) raised center median on all four legs as a pedestrian refuge with a pedestrian pushbutton. Use appropriate minimum pedestrian crossing times.
- 2) Reduce exposure to free right turn traffic by eliminating pedestrian crosswalks on the northbound Unser Boulevard approach. Provide crosswalks on remaining three approaches. This option reduces pedestrian exposure and may improve



traffic operations but is inconvenient for pedestrians and may be viewed as a further barrier to walking.

- 3) Provide grade-separated pedestrian crossings. This can be either a tunnel or a bridge. The required clearance for a bridge, and ADA grade requirements, results in a long span at significant cost. Similar constraints pertain to a tunnel, but in addition, tunnels are less desirable from a pedestrian security perspective and are less used than bridges. The bridge option may best be accommodated at mid-block locations connecting private developments with high levels of pedestrian demand between them (e.g., connecting an office park with a mixed-use retail area).

Traffic Operations Analysis

The purpose of the traffic operations analysis is to determine if the circulation network proposed in the Volcano Heights Concept Plan would degrade traffic operations below conditions if the circulation network was implemented as previously planned.

In 1989 the Albuquerque City Council adopted a bill (Enactment No. 169-1989) that establishes the alignment and design standards for Unser Boulevard, specifically Unser Boulevard shall be developed as a divided four lane parkway. It shall have a maximum design speed of 45 mph. Additionally, current City, County and State design guidelines for principal arterial roads recommend signalized spacing at ½-mile intervals with right-in/right-out only intersections at ¼-mile intervals. Paseo del Norte is planned as a six lane divided principal arterial with similar spacing requirements as Unser Boulevard. This adopted set of design standards represents the “base plan” as analyzed below.

The proposed Volcano Heights Concept Plan includes the development of a Town Center located at the intersection of Paseo del Norte and Unser. This town center contains a compact mix of higher-density residential, retail, and office uses. The Town Center also contains a pedestrian-scaled grid of internal streets. Additionally, the Town Center would be served by a proposed Bus Rapid Transit (BRT) system connecting Volcano Heights to job centers including downtown Albuquerque. The street and transit network, combined with the mix of land uses within the Town Center is intended to create a pedestrian and transit-oriented district that encourages trip-linking, and a choice of transportation options that reduces automobile travel. In order to create a walkable street network, and provide multi-modal access to the Town Center from the surrounding neighborhoods, the proposed street network includes full access signalized intersections spaced at approximately ¼-mile.

The Concept Plan proposes that Paseo del Norte within the Town Center be designed as a “boulevard” in the traditional sense. A traditional boulevard is a concept that combines a high-capacity thoroughfare with pedestrian-oriented frontages that encourage street activity. This is accomplished by providing frontage roads parallel to the arterial street separated by a median with breaks that allow access to/from the arterial and frontage



roads. The recommended design of the frontage roads is discussed in the previous section.

The Concept Plan also proposes to include exclusive busway/HOV lanes (high occupancy vehicle) on Unser Boulevard and Paseo del Norte, in addition to the mixed flow lanes (four on Unser and six on Pase del Norte). The busway/HOV lanes would be for the exclusive use of transit vehicles and/or could be utilized by high occupancy vehicles (e.g., vehicles with 3 or more persons). These lanes are critical to ensure the Bus Rapid Transit system is competitive with the automobile. The traffic operations analysis does not model these exclusive lanes resulting in a conservative evaluation. The analysis does reflect transit use in the form of a reduction in traffic volumes (see Forecasting Methodology below).

Summary of Forecasting Methodology

Initial year 2025 PM peak hour traffic projections have been developed by MRCOG. The MRCOG travel demand forecasting model is a regional model and estimates traffic volumes at a coarser level than needed to conduct an operations analysis of the Paseo del Norte and Unser corridors. Therefore the MRCOG model link volumes were manipulated to produce intersection turning movements. Two key assumptions were used in the development of traffic projections:

- 1) The MRCOG model link volumes at the “gateways” surrounding the Volcano Heights Concept Plan area remain constant in the initial projections and the derivation of “through” traffic (traffic that passes entirely through the plan area without stopping).
- 2) Traffic projections for land uses within the Concept Plan area are reduced by 25% to reflect the compact, mixed-use nature of the plan as well as the extensive BRT system. The reduction is applied only to trips that have at least one end within the plan area. This adjustment reduces the initial “gateway” volumes described above.

Through traffic in the plan area (traffic passing entirely through the Concept Plan area without stopping) equals about 38% of the total traffic using streets within the plan area. **Figure 9** shows the projected 2025 PM peak hour intersection turning movements for the Concept Plan and **Figure 10** shows the volumes for the Base Plan. Exhibit A provides a detailed description of the traffic projection methodology.

Network Assumptions

As discussed above, two scenarios are evaluated in the traffic operations analysis, 1) a base scenario which assigns the projected 2025 PM peak hour traffic to a network with signalized intersections spaced at ½ mile intervals or greater¹, and 2) a concept plan

¹ There is one exception to this spacing assumption in the base scenario: the intersection of Unser/F Street (Monroe) is located approximately ¼ mile north of the intersection of Paseo del Norte and Unser to permit access to the proposed town center.



scenario which assigns the projected 2025 PM peak hour traffic to a network with signalized intersections spaced at ¼ mile intervals or greater. For comparative purposes both scenarios are based on the same traffic projections—those reflecting the Concept Plan with a 25% internal reduction from MRCOG forecasts. The primary difference between the two scenarios is that the traffic in the base plan is concentrated at fewer intersections and the base plan does not include exclusive BRT/HOV lanes on Unser Boulevard and Paseo del Norte to and from the Town Center². Below is a summary of additional network assumptions common to both scenarios:

- Free flow speed = 45 mph
- Signalized intersection master cycle length = 100 seconds
- Interconnection: Paseo del Norte and Unser corridors are synchronized
- Number of through lanes on Paseo del Norte = 6
- Number of through lanes on Unser = 4
- Intersection turn lanes added as necessary to accommodate demand

Both Paseo del Norte and Unser Boulevards propose exclusive bus lanes leading into the Town Center. Although turning vehicles would be allowed to use these lanes, they are not modeled in the traffic operations analysis because they would overstate the street's capacity. Therefore the analysis is conservative.

Comparison of Traffic Operations

As described above the purpose of the traffic operations analysis is to determine whether the proposed Town Center street network would degrade traffic operations beyond conditions with ½ mile intersection spacing. This determination is based on both an intersection delay and level of service evaluation and an arterial travel time and level of service evaluation. **Table 1** compares intersection delay and level of service between the Base and Concept plans. A comparison of the common signalized intersections shows little difference in delay and level of service between the two plans.

Table 2 compares common performance measures for both Paseo del Norte and Unser Boulevards. Paseo del Norte operates at a similar average speed in both plans, with the exception of a slightly lower westbound speed in the Concept Plan. The base plan network operates at a LOS B eastbound and LOS C westbound, while the concept plan operates at LOS C in both directions. The difference in total corridor travel time between the two scenarios is less than 60 seconds. This can be considered a negligible difference concluding that the Concept Plan does not significantly degrade level of service.

Similar conclusions can be made regarding the comparison for Unser Boulevard in which both plans result in a similar average speed and level of service.

Feasibility of Grade Separating Paseo del Norte and Unser Boulevard

² While exclusive BRT/HOV lanes are being proposed in the Concept Plan, they are not modeled in the traffic operations analysis.



Kimley-Horn
and Associates, Inc.

*Volcano Heights Concept Plan
Traffic Analysis
April 11, 2006*

The objective of the Volcano Heights Town Center is to provide a pedestrian and transit-oriented mixed-use activity center, accessible by multiple modes of transportation. This objective needs to be balanced with a transportation system that must accommodate very high traffic demands. Grade-separating the intersection of Paseo del Norte and Unser Boulevard was identified as a way to accommodate traffic while improving pedestrian access to the Town Center. However, a feasibility assessment of a grade-separated interchange concluded that it would not provide the desired balance.

**Table 1
Comparison of Signalized Intersection Levels of Service
Base Plan versus Concept Plan**

Intersection	2025 PM Peak Hour			
	Base Plan		Concept Plan	
	Delay	LOS	Delay	LOS
Paseo del Norte and Woodmont North	3	A	4	A
Paseo del Norte and Woodmont South	n/a	n/a	18	B
Paseo del Norte and Azul	55	D	42	D
Paseo del Norte and Plata	32	C	32	C
Paseo del Norte and Rainbow	215	F	229	F
Paseo del Norte and Universe	218	F	268	F
Paseo del Norte/Office Campus Access	n/a	n/a	59	E
Unser Boulevard and Chasima	n/a	n/a	37	D
Unser Boulevard and Monroe (F St)	33	C	25	C
Unser Boulevard and Paseo del Norte	89	F	90	F
Unser Boulevard and Rainbow	193	F	126	F
Unser Boulevard and Squaw Road	108	F	87	F
Unser Boulevard and SW Parkway	39	D	17	B
Unser Boulevard and Woodmont	n/a	n/a	38	D

n/a = not applicable - Intersection does exist in this scenario.
Intersection delay = average controlled delay based on the operations method of the 2000 Highway Capacity Manual (TRB Special Report 209).

While a grade-separated interchange of Paseo del Norte and Unser Boulevard would improve traffic operations it would have the following impacts on the town center:

- Grade-separation is inconsistent with the pedestrian-orientation of the town center; while it reduces the volume of traffic pedestrian are exposed to, it increases the size of the intersection reinforcing it as a barrier to walking.
- While the grade-separation concept would cross Pase del Norte under Unser Boulevard, Unser Boulevard would need to be raised as it spans the undercrossing. The spanning of would reduce the visibility of the town center.
- The configuration of the interchange and required right-of-way would affect the shape of the adjacent parcels and orientation and placement of buildings to the street edge.



- Grade-separation precludes implementation of the boulevard concept on Paseo del Norte and Unser Boulevards.

Table 2
Comparison of Arterial Levels of Service
Base Plan versus Concept Plan

	2025 PM Peak Hour			
	Base Plan		Concept Plan	
Paseo del Norte Boulevard				
	Eastbound	Westbound	Eastbound	Westbound
Travel Time (minutes)	7.8	7.4	8.1	8.4
Distance Traveled (miles)	3.7	3.7	3.7	3.7
Average Speed (mph)	28	28	28	24
Arterial Level of Service	B	C	C	C
Total Vehicle Miles of Travel (Both Directions)	16,200		15,484	
Total Stops	23,900		27,000	
Unser Boulevard				
	Northbound	Southbound	Northbound	Southbound
Travel Time (minutes)	8.3	7.4	8.3	7.7
Distance Traveled (miles)	2.8	2.8	2.8	2.8
Average Speed (mph)	20	22	20	21
Arterial Level of Service	D	C	D	D
Total Vehicle Miles of Travel (Both Directions)	11,500		11,023	
Total Stops	21,300		23,000	
Arterial level of service based on the 2000 Highway Capacity Manual (TRB Special Report 209) urban streets methodology.				

The section below describes the right-of-way needs for a grade-separated interchange.

Right-of-Way Requirements for Grade-Separation

Based on a single-point urban interchange design, Paseo del Norte would undercross Unser Boulevard, connecting to Unser with on and off-ramps (similar to a diamond interchange configuration). Unser would be required to slope slightly above grade. The undercrossing of Paseo del Norte would require stabilized slopes (2:1) and some retaining walls as well as a bridge structure to accommodate Unser Boulevard and the at-grade single-point intersection. This configuration would require more right-of-way than a conventional at-grade intersection, as shown below.

- 1) Both approaches of Paseo del Norte would require a triangle of right-of-way 1,200 feet in length and 300 feet at its widest point (approximately 150 feet on either side of the street's centerline at Unser).



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2) Both approaches of Unser Boulevard would require a triangle of right-of-way 1,200 feet in length and 150 feet at its widest point (approximately 75 feet on either side of the street's centerline at Pasco del Norte).



Exhibit A

Travel Demand Forecasting Methodology

The steps described below document how the MRCOG year 2025 traffic projections on roadway segments were used to develop more detailed intersection turning volumes for the operations analysis. The methodology derived three types of trips affecting the Volcano Heights project area, and assigned these trips to the proposed network. The three types of trips include through traffic, external project traffic, and internal project traffic. These trip types, and how they were derived, are explained below. The methodology resulted in the estimation of PM peak hour intersection turning movements at key signalized intersections on Paseo del Norte and Unser Boulevards.

Derivation of Project Traffic Projections

The “project” is defined as the Volcano Heights area plan as proposed by the City and Taecker. This plan proposes ¼-mile signalized intersection spacing within the Town Center area of the plan, as well as a “boulevard” design on Paseo del Norte within the Town Center.

1. Obtained 2025 Concept Plan PM peak hour, volume shapefiles, TAZ shapefiles, and trip table from MRCOG.
2. Developed TRAFFIX network containing the proposed signalized intersection locations. The network contains Traffic Analysis Zones (TAZs) for each of the seven project zones, consistent with the TAZ system used by MRCOG in its regional travel demand forecasting model. Project area TAZs include: 63110, 63120, 63130, 63340, 63350, 63960, and 63970. The network also contains six project “gates” which create a “screenline” or perimeter around the project area. The gates include: Paseo del Norte (west), Paseo del Norte (east), Unser (north), Unser (south), Rainbow (north), and Universe (north). The TRAFFIX network has a detailed roadway network to reflect the study intersections on Paseo del Norte and Unser.
3. Reduced the trip table data to show trips internal to the project area zones.
4. Determined external “project” trips by TAZ. External trips are trips that begin or end within the Volcano Heights Concept Plan area and travel to/from one of the gates, representing trips that travel “external” to the project area. The external trips were calculated by the total TAZ volumes (measured at the centroid connection) minus internal trips from each TAZ. Internal trips are trips that have both origins and destinations within the Volcano Heights project area.
5. Determined “through traffic” (traffic that passes entirely through the project area from one external gate to another without stopping) on model network. Through traffic volumes were calculated by proportionally reducing the external in/out gates



volumes by the external “project” trips. The external gates (Rainbow and Universe) located directly north of the project site were assumed to contain only 5% project volumes.

6. Created a six by six matrix with the “through traffic” in and out volumes for each of the six external gates. Proportionally distributed volumes in the matrix by row then column until balanced. Input the “through traffic” volumes along Paseo del Norte and Unser into the TRAFFIX network.
7. Input the external “project” trips into the TRAFFIX TAZs. Paths were input based on multiple travel patterns that could be expected. Trip distribution was computed for the in and out external trips based on the total gate volumes minus the through traffic volumes. A 25% reduction was taken: 15% of the reduction was applied to the external “project” trip generation to account for non-auto trips³, while 10% of the reduction is internal trips made by automobile but that do not use the major arterial streets.
8. Manually distributed internal trips from one TAZ to another based on the MRCOG model’s trip table. Internal trips volumes were input into TRAFFIX.
9. 2025 Concept Plan intersection turning movement volumes were exported from TRAFFIX (final volumes reflected through trip volumes plus internal trips plus external trips).
10. The resulting modeled intersection turning movements were reviewed resulting in some minor adjustments to turning movements at individual intersections. Adjustments were made to either balance volumes between adjacent intersection, or to add traffic to intersection legs to better reflect the proposed land uses accessed by that intersection.
11. Transfer resulting intersection turning movements to SYNCHRO model for detailed traffic operations analysis.

Derivation of Without Project Traffic Projections

The Without Project scenario is defined as the Volcano Heights area plan as proposed by the Planning team including Taecker Urban Design and Planning using current roadway design standards that require ½ -mile signalized intersection spacing within the plan area. In this scenario, the volumes derived in the steps above were re-assigned to a lower number of signalized intersections representing current spacing standards.

³ A 25% reduction reflects a general agreement amongst City planning and transportation staff, and MRCOG staff that the compact mixed-use, and higher density development (as well as proposed transit system) of Volcano Heights results in lower trip generation than if the area was planned on conventional suburban patterns.

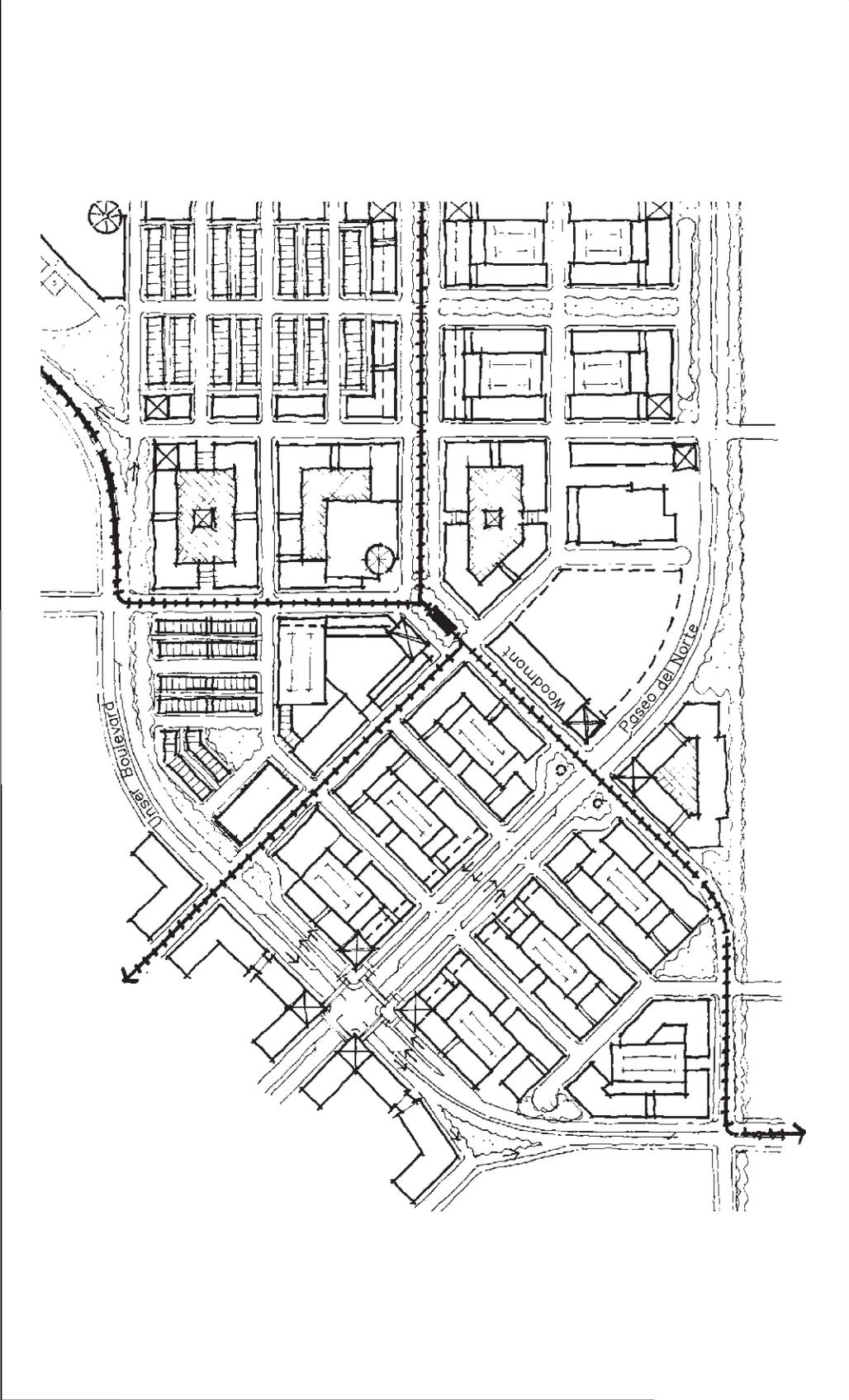


Figure 1
Illustrative Plan of Volcano Heights
Town Center

Albuquerque, New Mexico
Volcano Heights



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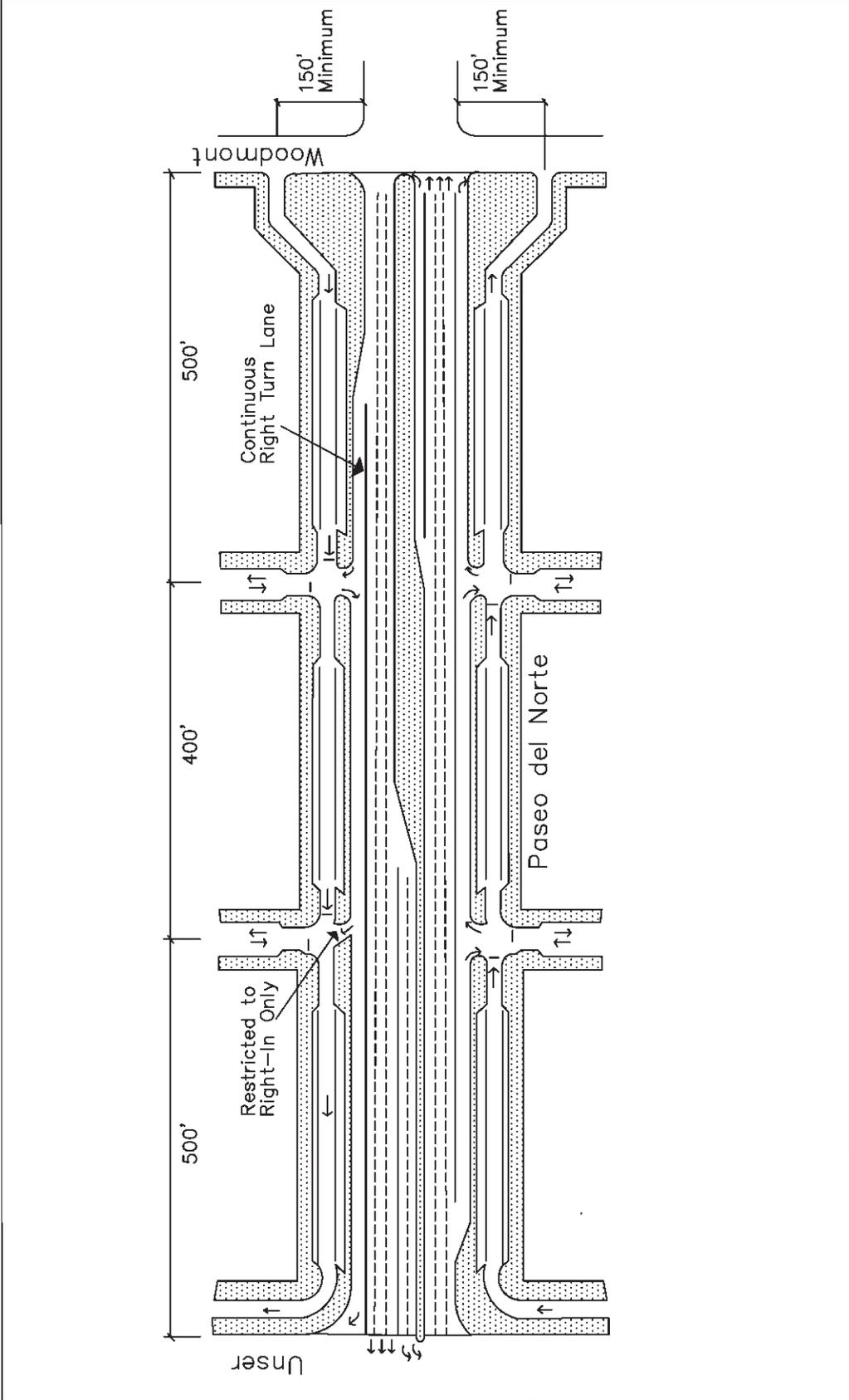
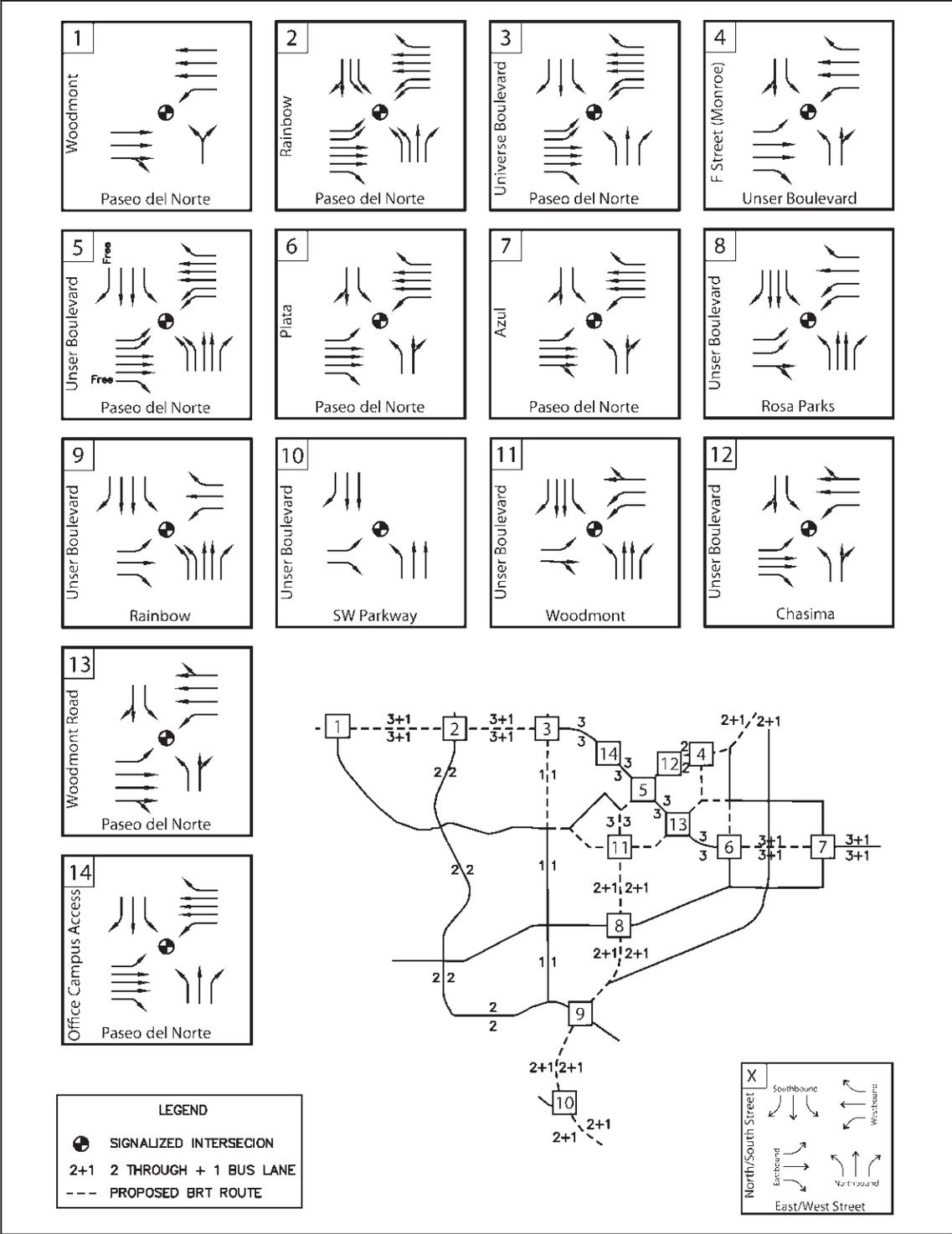


Figure 2
Conceptual Design of
Paseo del Norte Boulevard

Albuquerque, New Mexico
Volcano Heights

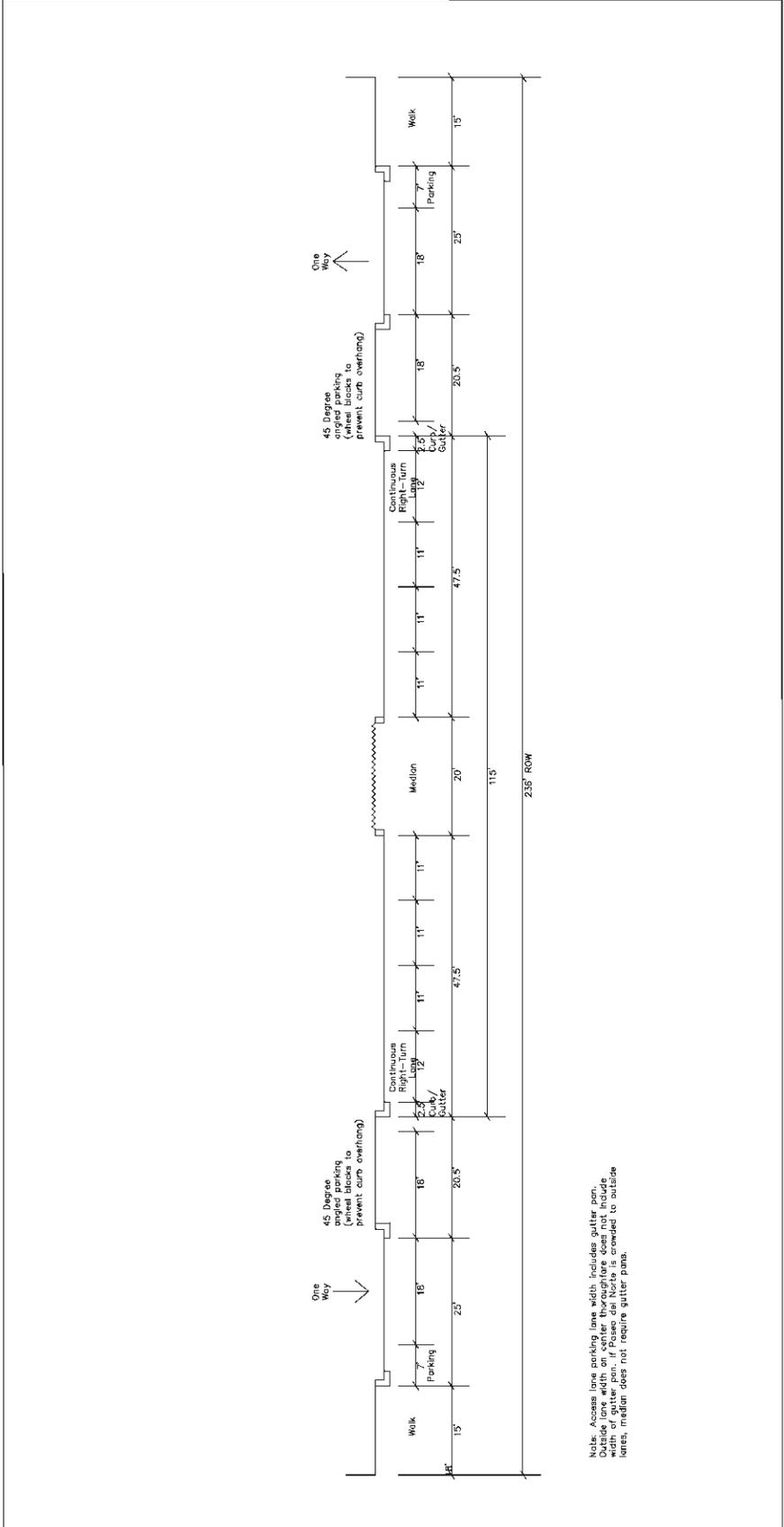




**Albuquerque, New Mexico
Volcano Heights**

**Figure 3
2025 Concept Plan
Lane Geometry**



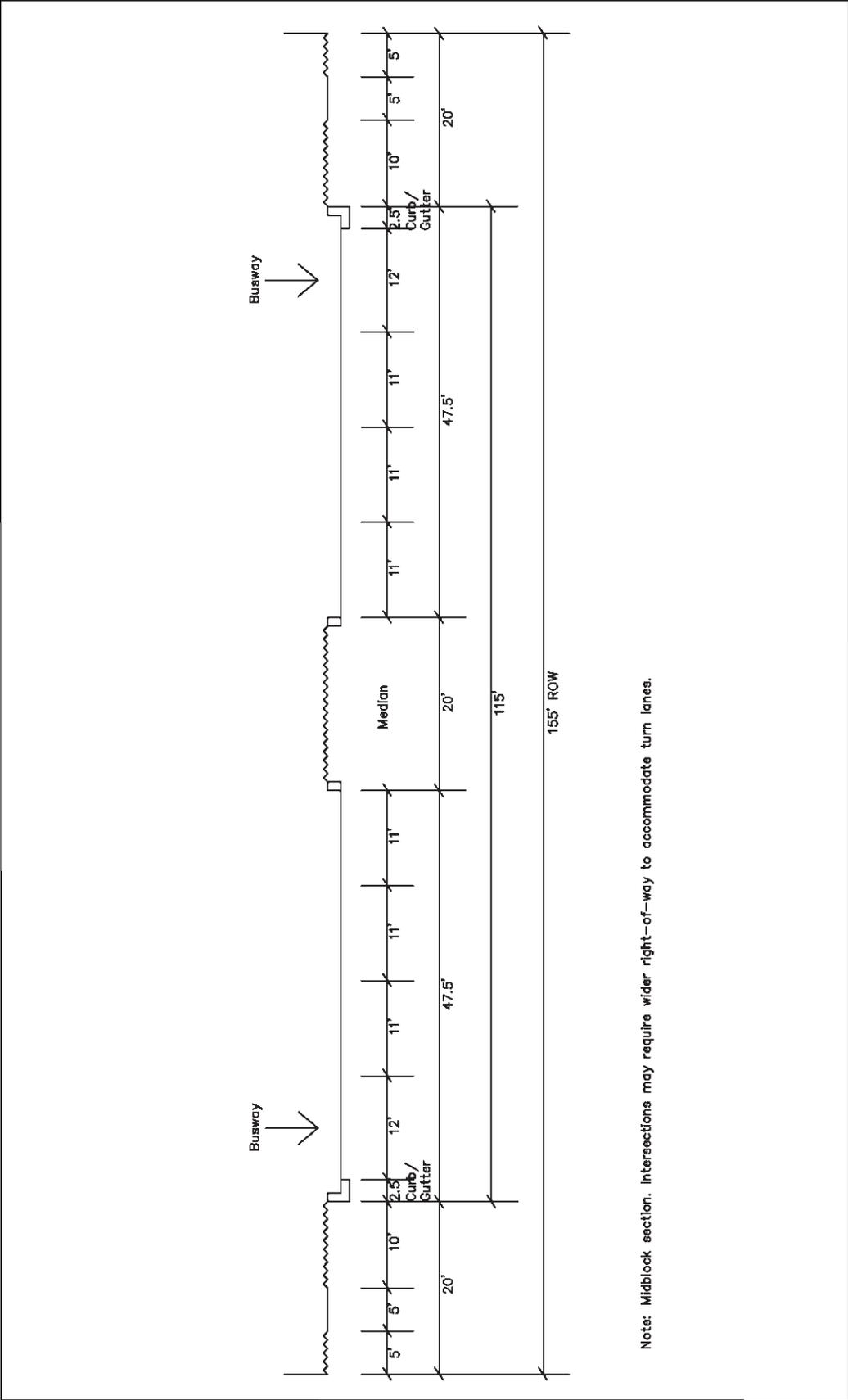


Note: Access lane parking lane width includes gutter pan. Width of gutter pan is 2.5 feet. If Paseo del Norte is crowded to outside lanes, median does not require gutter pans.

Figure 4
Paseo del Norte (Access Lane Both Sides)

Albuquerque, New Mexico
Volcano Heights





Note: Midblock section. Intersections may require wider right-of-way to accommodate turn lanes.

Figure 5
Paseo del Norte (6 Lane plus BRT Busway)

Albuquerque, New Mexico
Volcano Heights



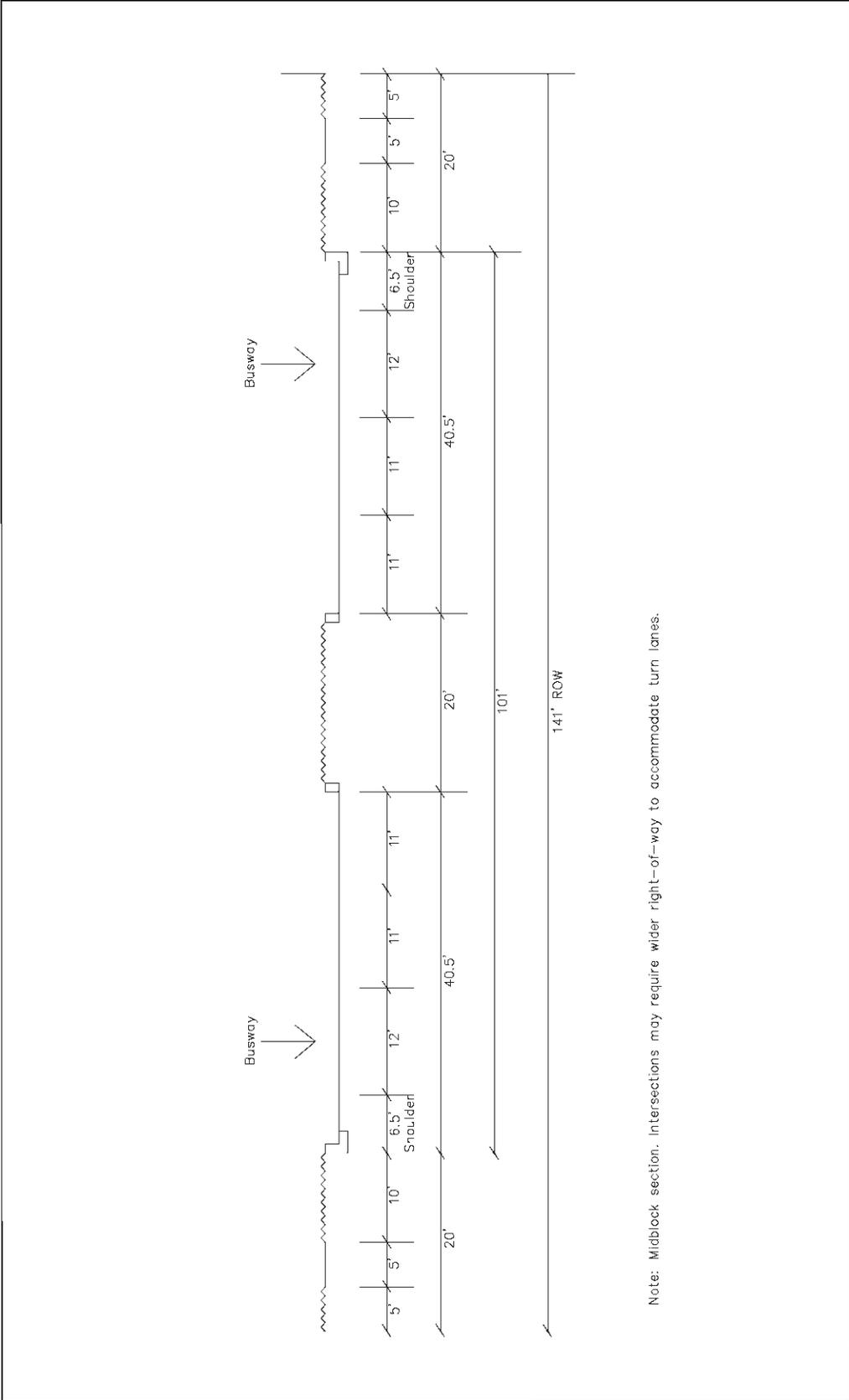
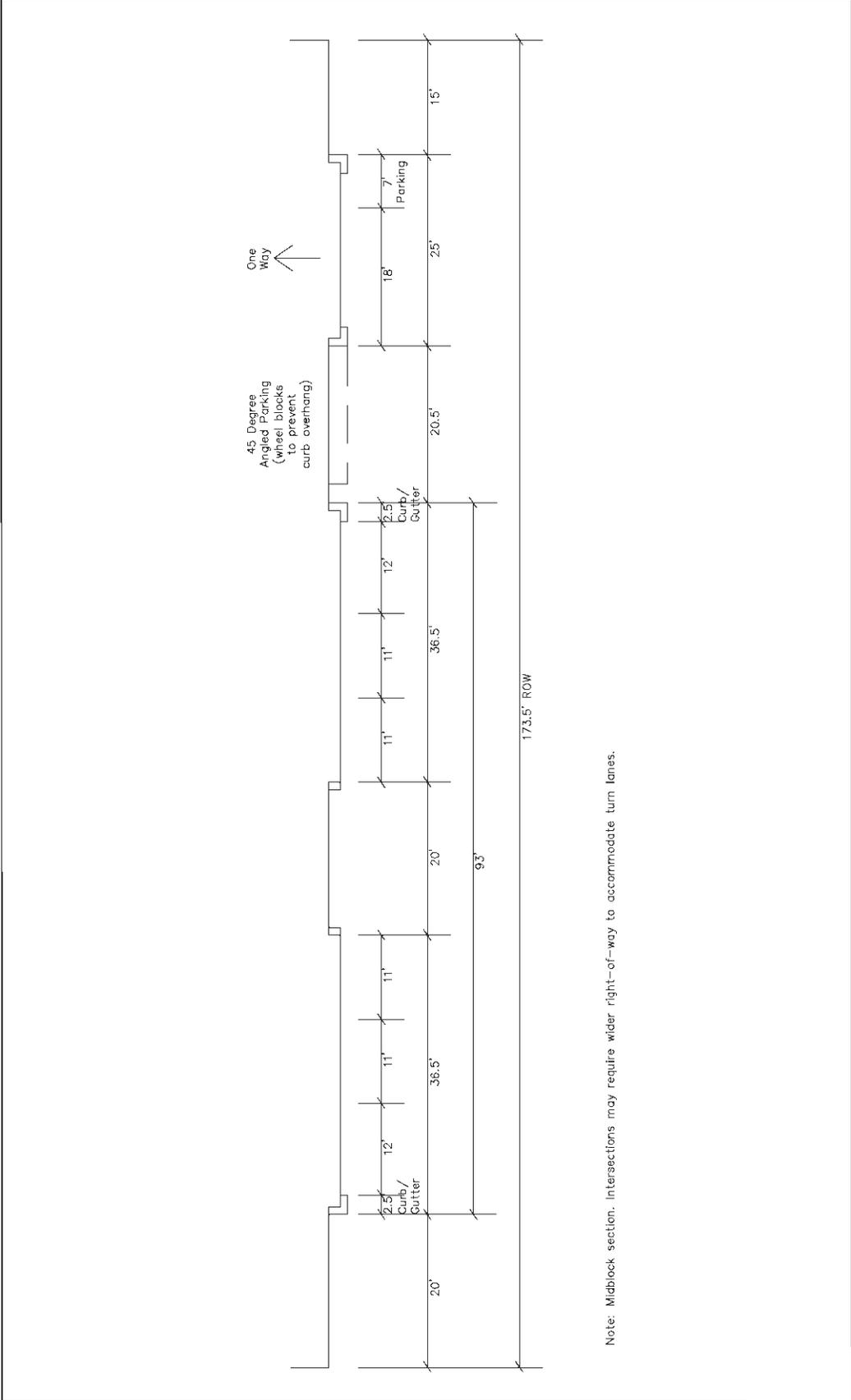


Figure 6
Paseo del Norte 6 Lane without BRT
Unser 6 Lane without BRT (Paseo del Norte to Woodmont)
Unser 4 Lane with BRT (South of Woodmont, North of F St)

Albuquerque, New Mexico
Volcano Heights

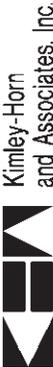




Note: Midblock section. Intersections may require wider right-of-way to accommodate turn lanes.

**Figure 7
Unser Boulevard
(Access Lane One Side)**

**Albuquerque, New Mexico
Volcano Heights**



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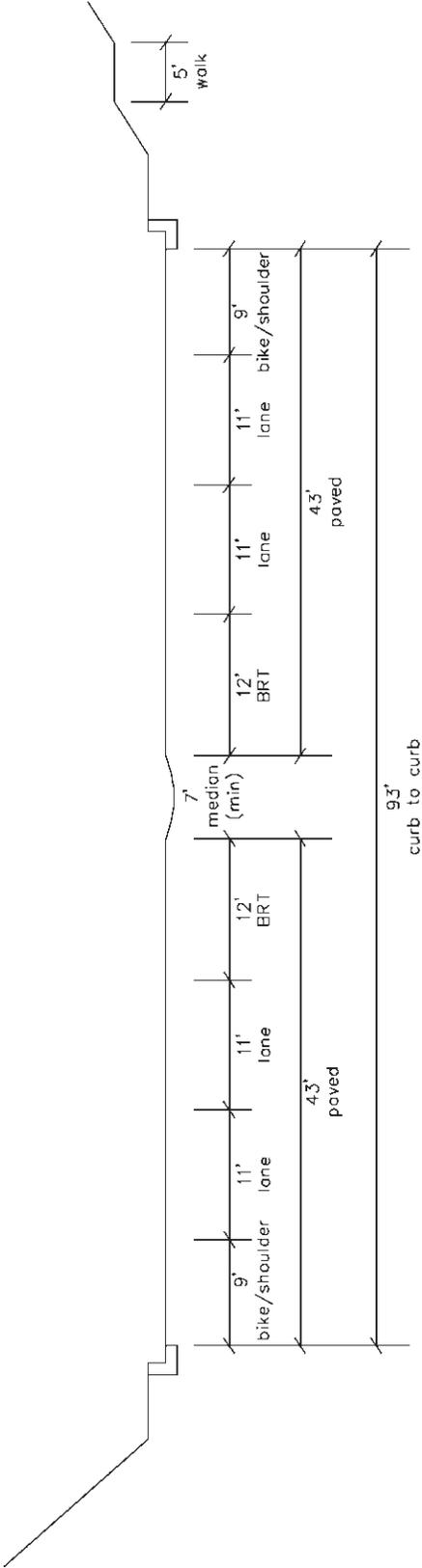
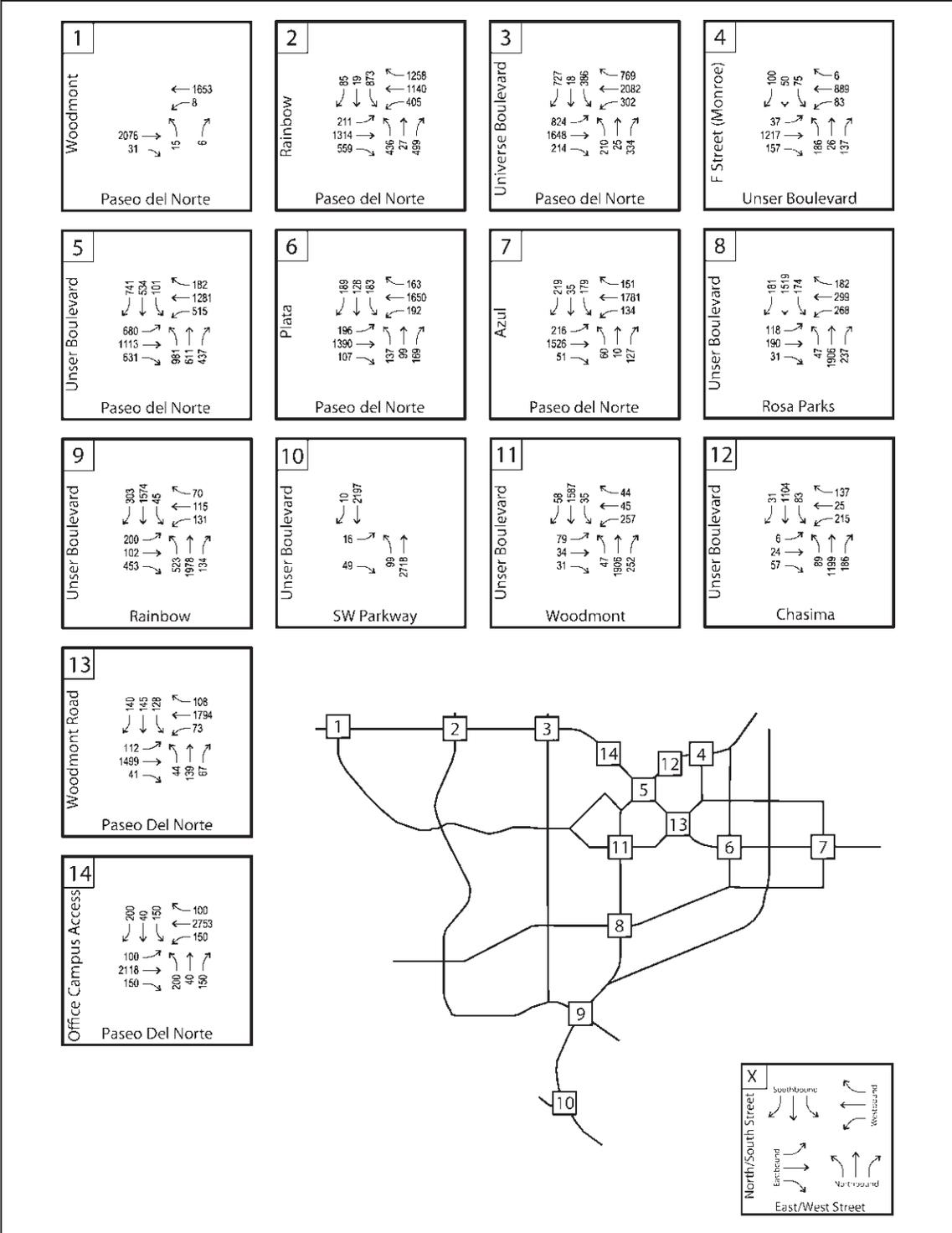


Figure 8
Unser Boulevard (with BRT)
Through Escarpment

Albuquerque, New Mexico
Volcano Heights

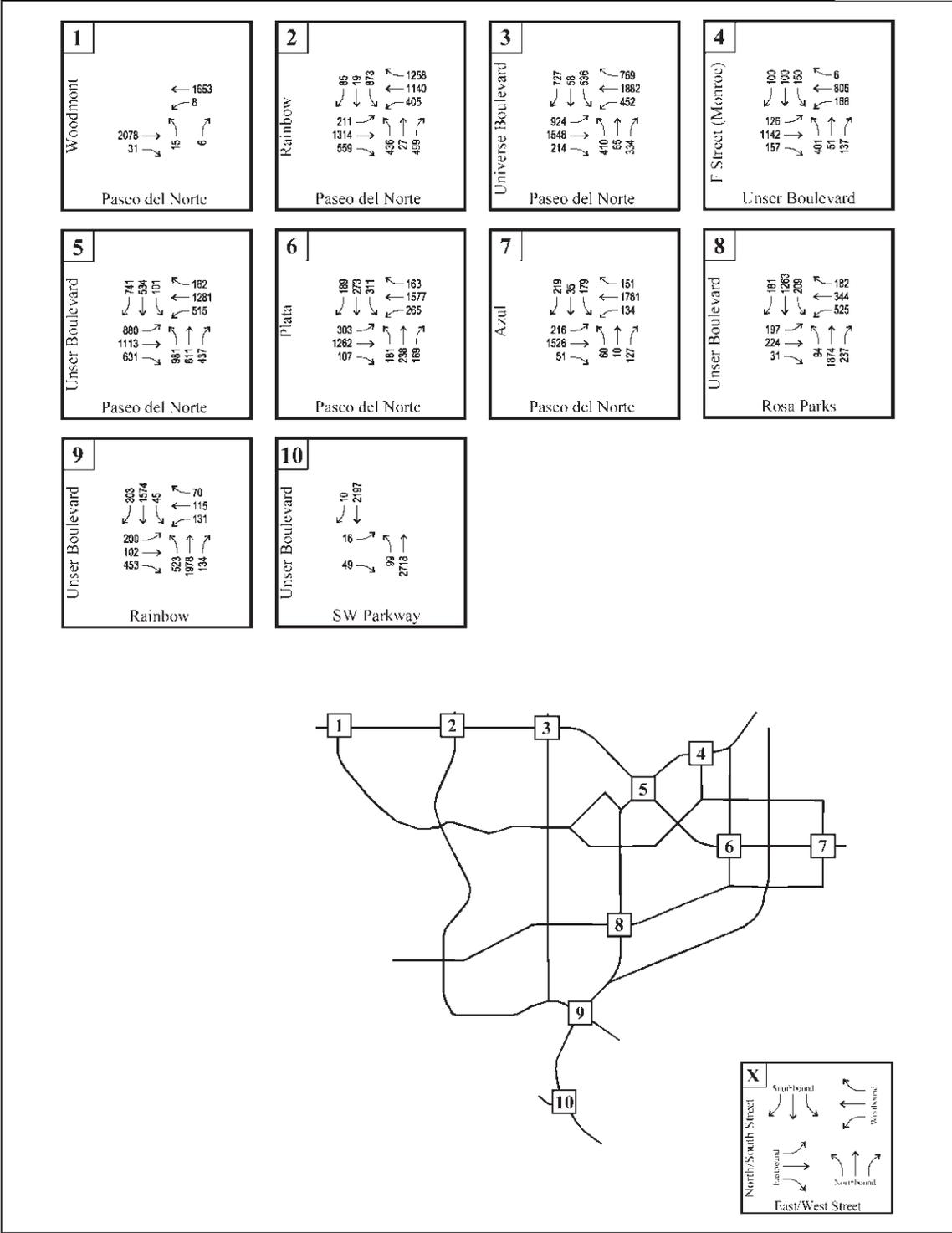




Albuquerque, New Mexico
Volcano Heights



Figure 9
2025 Concept Plan
PM Peak Hour Volumes



Albuquerque, New Mexico
Volcano Heights



Figure 10
2025 Base Plan
PM Peak Hour Volumes