REPORT TO COUNCIL
City of Sacramento

915 I Street, Sacramento, CA 95814-2604
www. CityofSacramento.org

Consent
February 17, 2009

Honorable Mayor and
Members of the City Council

Title: Florin and Meadowview Station Area Concept Plans & Design Guidelines

Location/Council District: Districts 5 and 8

Recommendation: Adopt: 1) a **Resolution** accepting the development program, conceptual design and design guidelines for the Florin Road Light Rail Station area as designated, and 2) a **Resolution** accepting the development program, conceptual design and design guidelines for the Meadowview Road Light Rail Station area as designated.

Contact: Fedolia "Sparky" Harris, Senior Planner, (916) 808-2996

Presenters: Fedolia "Sparky" Harris, Senior Planner, (916) 808-2996

Department: Transportation

Division: Office of the Director

Organization No: 15001041

Description/Analysis

Issue: Development programs, conceptual plans and design guidelines have been prepared to document the vision of staff and the community for future development of transit-oriented development (TOD) around the Meadowview Road light rail station and the Florin Road light rail station.

Policy Considerations: Staff's recommendation is consistent with the City's adopted Smart Growth Principles including: mixing land uses and supporting vibrant city centers, taking advantage of existing community assets emphasizing joint use of facilities, creating a range of housing opportunities and choices, fostering walkable close-knit neighborhoods, providing a variety of transportation choices, making development decisions predictable, fair, and cost-effective, encouraging citizen and stakeholder participation in development decisions, and supporting land use, transportation management, infrastructure and environmental planning programs that reduce vehicle emissions and improve air quality.

Environmental Considerations:

California Environmental Quality Act (CEQA): There are no environmental considerations associated with this report. It is not considered a project under Section 21065 of CEQA and CEQA Guidelines Section 15378 (b)(5)).

Sustainability Considerations: The development programs, concept plans, and urban design guidelines presented in this report further the sustainability goals of the City by planning for more "complete streets" in the project areas, planning for neighborhood serving uses within walking distance of planned and existing housing, planning for additional housing in close proximity to light rail transit, proposing development intensities consistent with the SACOG Blueprint, and planning for a diverse mixture of open spaces.

Other: None.

Commission/Committee Action: The development program, conceptual plans and design guidelines were presented to the Design Commission for review and comment on June 2, 2008. No substantial comments were received. The development program, conceptual plans and design guidelines were presented to the Planning Commission on August 14, 2008 for review and comment. No substantial comments were received. The conceptual plans and design guidelines were presented the Parks and Recreation Commission for review and comment on September 30, 2008. No substantial comments were received.

Rationale for Recommendation: Tremendous opportunities to provide quality transit oriented development exist at the Florin Road light rail station area and the Meadowview Road light rail station area. Realizing these opportunities requires planning for mixed-use housing opportunities for a variety of citizens while improving the opportunities to use rail transit for trip-making – thus providing travel options to new residents, while reducing greenhouse gas emissions and travel in the region, as well as reducing traffic congestion in the immediate area.

The development program, conceptual plans and design guidelines for these areas should not be construed as Specific Plans. These plans and guidelines provide both general and specific guidance and direction to future development of the area that will help achieve adopted goals of the City as well as the vision developed with the affected communities. Should future development generally follow the concept and guidelines contained herein, it is anticipated that a more streamlined and less complex development review process will follow compared to an alternate development strategy that does not substantially conform to the directions provided.

Saving time for future development implementation by providing a clear example of what would be acceptable at each station, as well as providing program level estimates for the utility improvements required for such a plan and thus streamlining the process to realizing TOD at these sites, is a key purpose of these plans. The other key purpose is to develop a set of guidelines for both stations that clearly

expresses the vision of the City to help guide transit-oriented development at these locations should development occur in a slightly different manner.

It should be noted that the concepts presented herein reflect development intensities greater than anticipated by the current zoning, as well as the introduction of several key themes into the development approach. Alternative concepts also exist (including, most importantly, an even higher intensity of development than proposed herein) which could also meet the city's goals. Nothing in this document should be construed as either restricting or discouraging the consideration of alternative concepts at both of these sights including increased density above the levels proposed herein, should the market dictate at the time of development. However, options that propose development intensities below the levels proposed herein would not be consistent with the spirit and intent of this document, the vision developed through our collaborative process, nor the generally accepted principles of transit oriented development.

It is the intent of the City of Sacramento in producing these development programs, conceptual plans and design guidelines to provide the development community with a clear but general guide for developing the Florin Station area and the Meadowview Station area in a manner consistent with TOD-friendly principles, while remaining responsive to the community and decision-maker's vision at the time of actual project review. Translating the concepts from these plans into market-responsive developments will prove to be a tremendous accomplishment with regional benefits in Sacramento.

Public/Neighborhood Outreach and Comments: A grant from the California State Treasurers Office was secured to fund extensive outreach for the development of the plans attached. Over 100 completed comments cards were collected from concerned neighbors at the first community workshop held for this project. Concerns from these comment cards drove the development of the plan. Outreach was also performed at Luther Burbank High School which provided opinions from an often overlooked segment of the community.

Financial Considerations: There are no financial considerations created by the adoption of the Florin and Meadowview Station Area Concept Plans & Design Guidelines.

Emerging Small Business Development (ESBD): Not applicable.

Respectfully Submitted by: _____
Francesca L. Halbakken
Operations Manager

Approved by: _____
Jerry Way
Director of Transportation

Recommendation Approved:

_____
for Ray Kerridge
City Manager

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Attachment 1

BACKGROUND

The attached documents present conceptual development plans for the land within one-quarter mile of the transit stations at the Florin and the Meadowview stations on the South line of the Sacramento Regional Transit Agency's (RT) light rail system.

The project deals with two of Sacramento's best opportunities for Transit Oriented Development (TOD). RT owns at least 20 acres of land at each station. High development potential, ridership generation, and a substantial return on investment will encourage RT to gradually replace surface parking with transit village supportive development on land owned by the district. This trend will lead to additional development on the privately held parcels in close proximity to the station platforms.

RT has begun the process of identifying system-wide surplus property and has subsequently released a request for development proposals for several of its properties including land at the Florin Station. Additionally, developers near the Meadowview Station, have obtained entitlements for a large single-family development just north of the RT owned land.

The Florin and Meadowview stations were included in the Transit for Livable Communities (TLC) project sponsored by RT and completed in 2002. These development programs, concept plans and urban design guidelines included in this report build upon the concepts embodied in the TLC. The previously adopted TLC plans have been reviewed, revised and updated to reflect current market conditions, and to respond to the lessons learned from the community as part of a broad community outreach program.

This effort was funded by grants from the State of California Department of Transportation (Caltrans) and the California Pollution Control Financing Authority (CPCFA). The concept of Environmental Justice, specifically targeting historically underrepresented and disengaged communities in the planning process, was a key objective. Meetings with a diverse cross section of the community as well as elected and appointed officials were designed to yield guidelines for the TOD plans with a vigilant eye to addressing pedestrian accessibility, security and safety, shared open spaces, venues for community service, and the potential for housing new arrivals and the elderly.

The Florin and Meadowview TOD have been designed to:

- Meet the goals of the local residents that have been expressed and recorded in the workshops held during the course of this study.
- Add new houses for families and individuals at all income levels seeking the convenience and security of a mixed-use urban center within walking distance of a light rail station that will provide regional access.
- Meet the pent-up market demand that is already evident in the development proposals being received for the two station areas.
- Increase transit patronage, both by adding new residents and also by adding destination retail and community services to the development program.

- Continue to provide support for park and ride activity.

These plans include an assessment of the need for, and the cost of, new and improved utilities and changes to the traffic management systems which will be triggered by additional development near the two transit station sites. The study team investigated the existing capacity of systems, calculated the demand for utilities that would generated by an aggressive development program, and quantified the need for additional capacity in streets, sewers, water, drainage, power and telecommunications. Clarifying these needs ahead of development was intended to help with the eventual promotion of transit supportive uses and marketing.

Following the acceptance of these development programs, concept plans, and design guidelines, the City and RT will have sound planning and design guidelines upon which to make predictable decisions when the development community responds with substantive development proposals.

Attachment 2

RESOLUTION NO.

Adopted by the Sacramento City Council
Date

ACCEPTING THE DEVELOPMENT PROGRAM, CONCEPTUAL PLAN AND DESIGN GUIDELINES FOR THE FLORIN ROAD LIGHT RAIL STATION AREA (M03-013)

BACKGROUND

The Florin Station Plans:

A. Applies to the parcels highlighted in Exhibit A around the Florin light rail stations in South Sacramento; and

B. Present a strategic opportunity to transform the South Sacramento community into a vibrant, mixed-use transit district; and

C. Supports the General Plan's Vision and Guiding Principals; and

D. Maintains consistency with the SACOG Blueprint and its Growth Principles; and

E. Supports city policy to promote alternative modes of transportation; and

F. Supports city policy to revitalize commercial corridors; and

G. Provides broad community participation in order to gather the opinions of those residing both inside and outside the project boundaries; and

H. Promotes improved mobility and circulation of all transportation modes in the project area.

BASED ON THE FACTS SET FORTH IN THE BACKGROUND, THE CITY COUNCIL RESOLVES AS FOLLOWS:

Section 1. The Florin Station Plan comprised of the development program, concept plan and urban design guidelines is accepted as the guiding vision for development on parcels within the quarter-mile radius around the Florin Road light rail station platform.

Table of Contents:

Exhibit A – Map of the Florin Light Rail Station Plan Area
Exhibit B – Development Program
Exhibit C – Key Map

Adopted by the City of Sacramento City Council on February 17, 2009 by the following vote:

Ayes:

Noes:

Abstain:

Absent:

Exhibit A

Wah Avenue
27th Street
Canyon Valley Way
Canyon Creek Court
Carnation Avenue
Yreka Avenue
Indiana Lane
North Sundown Drive
North Tranquility Drive
Serenity West
Tranquility Drive
Sundown Drive
Serenity Drive
Florin Road
© 2008 Tele Atlas
1057 ft

Exhibit B

FLORIN STATION PROGRAM									
ZONE	Acres	Residential Uses			Non Residential Uses		Open Space Acreage		
		Building Type	Base	Max	Land Use	SqFt	Factor	Demand	Provided
A	5.0	Townhouses	30	30			0.0075	0.23	
		Townhouses over Flats	6	6			0.0075	0.05	
		Flats	6	6			0.0056	0.03	
		Medium Density Apts/Condos	90	126			0.0044	0.40	
		Apts/Condos over Retail	36	54			0.0044	0.16	
					Retail	5,250			
B	5.7	Townhouses over Flats	26	26			0.0075	0.20	
		Flats	26	26			0.0056	0.15	
		Duplexes	28	28			0.0075	0.21	
					Parks	11,500			0.26
C	1.4				Parks	41,000			0.94
D	1.4				Parks	41,000			0.94
E	3.0	Townhouses	12	12			0.0075	0.09	
		Townhouses over Flats	7	7			0.0075	0.05	
		Flats	7	7			0.0056	0.04	
		Apts/Condos over Retail	40	60			0.0044	0.18	
					Retail	7,500			
F	3.4	Townhouses	6	6			0.0075	0.05	
		Townhouses over Flats	12	12			0.0075	0.09	
		Flats	12	12			0.0056	0.07	
		Medium Density Res	80	112			0.0044	0.35	
					Greenways	8,800			0.20
G	0.9				Civic Center	10,000			
H	1.6				Plaza	45,000			1.03
I	4.7	Medium Density Res	70	98			0.0044	0.31	
		Live/Work Loft Houses	32	32			0.0056	0.18	
					Greenway	15,000			0.34
					Retail	20,500			
J	2.8				Parks	87,000			2.00
K	3.9	Townhouses over Flats	38	38			0.0075	0.29	
		Flats	38	38			0.0056	0.21	
		Medium Density Res	50	70			0.0044	0.22	
					Parks	10,500			0.24
L	6.1	Townhouses over Flats	57	57			0.0075	0.43	
		Flats	57	57			0.0056	0.32	
					Parks	17,500			0.40
M	3.7				Commercial	Redevelopment			
N	7.8				Commercial	Redevelopment			
O	1.8	Townhouses over Flats	16	16			0.0075	0.12	
		Flats	16	16			0.0056	0.09	
P	4.3	Townhouses over Flats	45	45			0.0075	0.34	
		Flats	45	45			0.0056	0.25	
		Medium Density Res	30	30			0.0044	0.13	
					Parks	5,500			0.13
Total	**57.5**		**918**	**1072**				**5.20**	**6.49**
Gross DU/Acre			**16.0**	**18.6**					

Exhibit C

L
J
K
I
H
F
B
C
D
E
G
A
M
N
O
P
Wah Avenue
Carnation Avenue
Yreka Avenue
North Sundown Drive
North Tranquility Drive
Serenity West
Tranquility Drive
Sundown Drive
Nancy Lan
Club
Florin Road
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Attachment 3

RESOLUTION NO.

Adopted by the Sacramento City Council

ACCEPTING THE DEVELOPMENT PROGRAM, CONCEPT PLAN AND DESIGN GUIDELINES FOR THE MEADOWVIEW ROAD LIGHT RAIL STATION AREA (M03-013)

BACKGROUND

Meadowview Station Plans:

A. Applies to the parcels highlighted in Exhibit A around the Meadowview light rail stations in South Sacramento; and

B. Present a strategic opportunity to transform the South Sacramento community into a vibrant, mixed-use transit district; and

C. Supports the General Plan's Vision and Guiding Principals; and

D. Maintains consistency with the SACOG Blueprint and its Growth Principles; and

E. Supports city policy to promote alternative modes of transportation; and

F. Supports city policy to revitalize commercial corridors; and

G. Provides broad community participation in order to gather the opinions of those residing both inside and outside the project boundaries; and

H. Promotes improved mobility and circulation of all transportation modes in the project area.

BASED ON THE FACTS SET FORTH IN THE BACKGROUND, THE CITY COUNCIL RESOLVES AS FOLLOWS:

Section 1. Meadowview Station Plans is acceptable as the guiding vision for development within the quarter-mile radius around the Florin and Meadowview light rail stations.

Table of Contents:

Exhibit A – Map of the Meadowview Light Rail Station Plan Area
Exhibit B – Development Program

Exhibit C – Key Map

Adopted by the City of Sacramento City Council on February 17, 2009 by the following vote:

Ayes:

Noes:

Abstain:

Absent:

Exhibit A

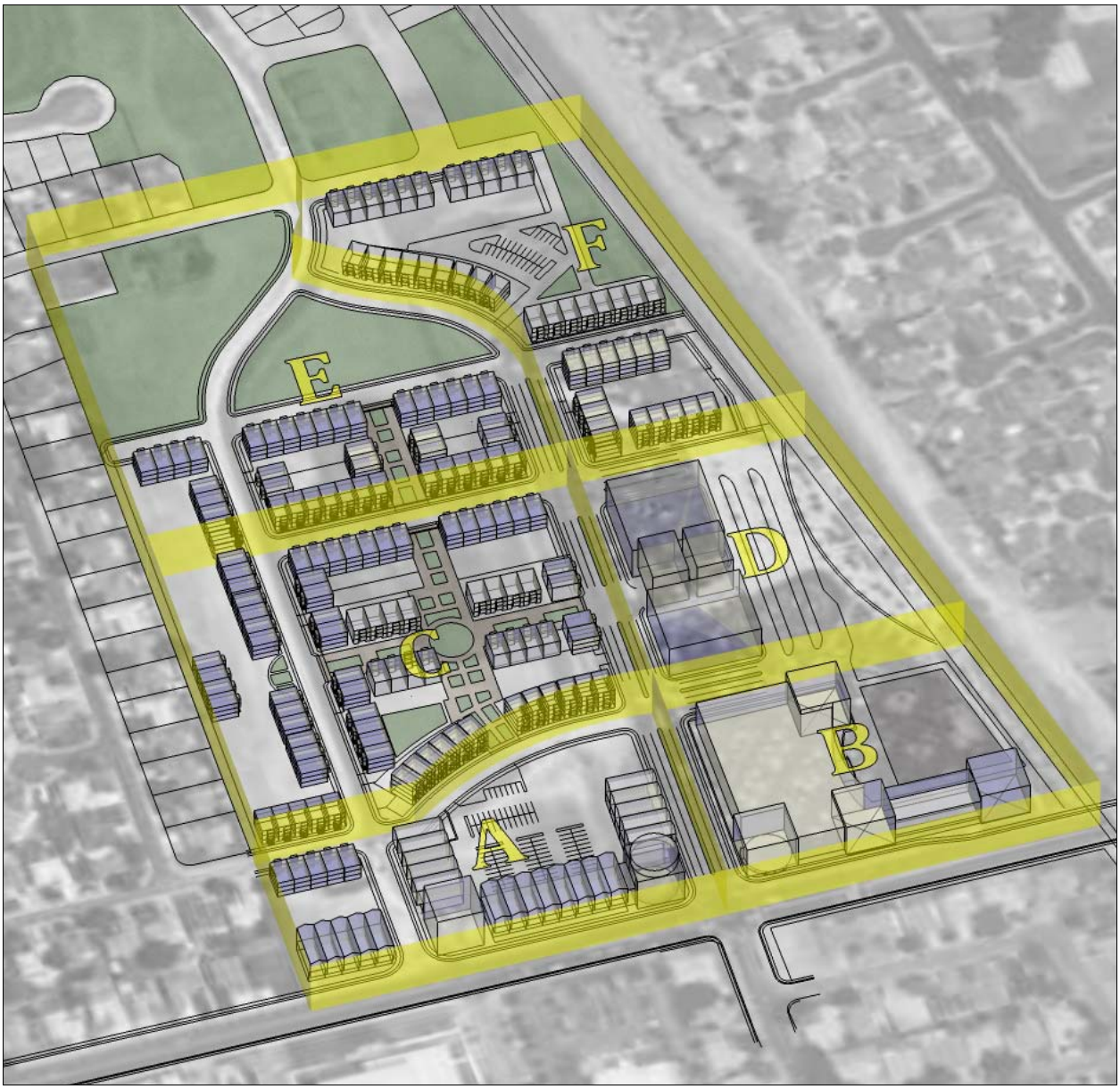
Melinda Way
Murata Ave
Starstone Way
Pumice Ct
Quartz Ct
Bushwood Ct
Pennywood Ct
Mountainwood Ct
Ashwood Way
29th St
32nd St
Desertwood
Carrotwood
Tuscale Way
Roldo Ct
Meadowview Rd
Andros
© 2009 Tele Atlas

Exhibit B

MEADOWVIEW STATION PROGRAM

ZONE	Acres	Residential Units			Non Residential Uses		Open Space Acreage		
		Building Type	Base	Max	Land Use	SqFt	Factor	Demand	Provided
A	4.8	Town Houses over Flats	5	5			0.0075	0.04	
		Flats	5	5			0.0056	0.03	
		Apts/Condos over Retail	74	90	Retail	20,000	0.0044	0.33	
B	4.5	Apts/Condos over Market	18	25	Market	30,000	0.0044	0.08	
					Plaza				
C	7.1	Town Houses over Flats	45	45			0.0075	0.34	
		Flats	45	45			0.0056	0.25	
		Medium Density Apts/Condos	56	70			0.0044	0.25	
					Mini-Parks	8,000			0.18
					Greenways	17,500			0.40
D	4.1	Medium Density Apts/Condos	48	60			0.0044	0.21	
					Retail	22,000			
					Commercial	30,000			
E	7.6	Town Houses over Flats	35	35			0.0075	0.26	
		Flats	35	35			0.0056	0.20	
		Medium Density Apts/Condos	28	35			0.0044	0.12	
					Parks	129,000			2.96
F	5.2	Medium Density Apts/Condos	140	174			0.0044	0.62	
					Parks	16,000			0.37
Total	**33.4**		**534**	**624**				**2.72**	**3.91**
Gross DU/Acre			**16.0**	**18.7**					
Hampton Station Development									
	28.1	Small Lot SF	155	155			Satisfied through Entitlement		
Total	**61.5**		**689**	**779**					

Exhibit C



Attachment 4

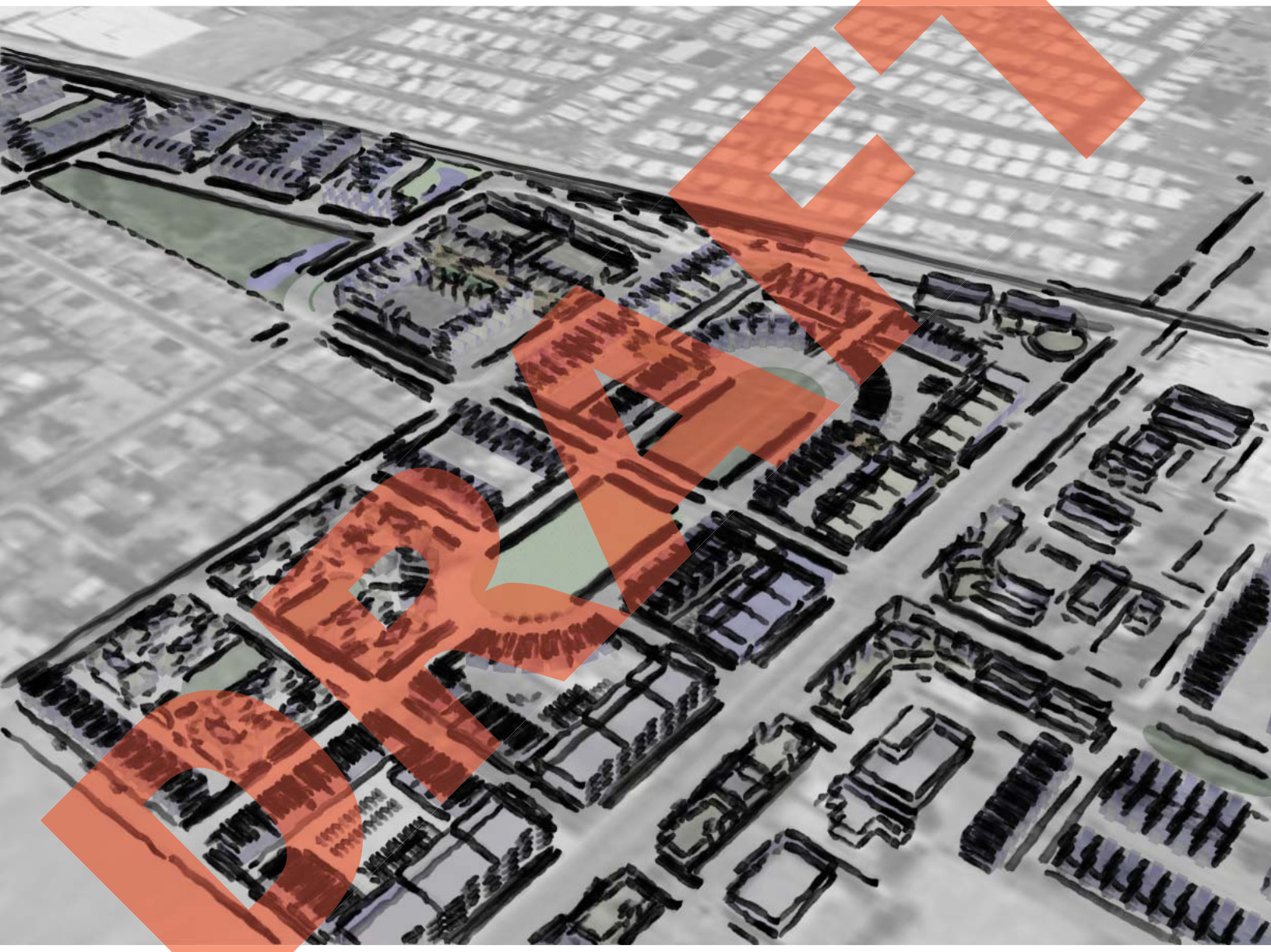
Florin Road Station Area TOD Concept and Guidelines

Attachment 5

Meadowview Road Station Area TOD Concept and Guidelines

FLORIN ROAD STATION AREA

TRANSIT ORIENTED DEVELOPMENT (TOD) CONCEPT AND GUIDELINES



CITY OF SACRAMENTO
Department of Transportation
January 2009

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FLORIN ROAD STATION AREA

TRANSIT ORIENTED DEVELOPMENT (TOD) CONCEPT AND GUIDELINES

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CITY OF SACRAMENTO
Department of Transportation
January 2009

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PURPOSE

At the Florin Road Station, there is a tremendous opportunity to provide quality development which is oriented towards and compatible with the Sacramento Regional Transit (RT) system. It is the goal of the city of Sacramento to have this area develop in a transit oriented development (TOD) - friendly manner. Achieving this goal will provide mixed-use housing opportunities for a variety of citizens while improving the opportunities to use rail transit for trip-making – thus providing travel options, reduce greenhouse gas emissions and reduce traffic congestion in the area.

Figure 1 Florin Road Station Location

This document should not be construed as a *Specific Plan* for the area and the information and concepts presented herein have not been environmentally cleared through the California Environmental Quality Act (CEQA). This document does provide both general and specific guidance and direction to future development of the area that will help achieve the goal of the city. Should future development generally follow the guidelines contained herein, it is anticipated that the development review process will recognize this consistency and thus will be less complex and time consuming than an alternate strategy which does not work towards the achievement of the city's goal.

It should be noted that the concepts presented herein reflect an increased densification of the Florin Road Station area, as well as the introduction of key themes into the development approach. Alternative concepts also exist (including most importantly a greater densification than proposed herein) which could also meet the city's goals. Nothing in this document should be construed as either restricting nor discouraging *increased* density above the levels proposed herein, should the market dictate. However, options that *decrease* density below the levels proposed herein are not consistent with the spirit and intent of this document and must be recognized as such.

It is the intent of the city of Sacramento in producing this document to provide the development community with a general guide for developing the Florin Road Station area in a manner consistent with TOD-friendly principles, while being responsive to the community and decision-maker's vision at the time of the study completion. Translating the concepts from this

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document into a market-responsive development at the Florin Road Station will become a tremendous accomplishment with regional benefits in Sacramento.

GENERAL THEMES FOR THE FLORIN ROAD STATION AREA

This document consists of six distinct, but interconnected, sections. The sections are:

- Background ~ provides an overview of the station area and the development objectives to achieve and for which this *Concept and Guidelines* has been prepared;
- Development Framework ~ the land use, transportation and parks components are presented as guidance;
- An Illustrative Plan ~ Describes how the land use, transportation and parks "fit" into one design concept;
- The Development Program ~ Describes in greater detail the various land uses recommended as guidance, as well as illustrative examples; and
- The Design Guidelines ~ Presents the various "design principles" and architectural concepts that are most important to fulfill the intent of the TOD concept for the Florin Road Station Area.
- A *Zoning Table* which provides a comparison of the categories of land use that are recommended in the Plan with the City of Sacramento's current zoning code. As the General Plan 2030 is being developed, there maybe some modifications to the existing Zoning Ordinance, that may change these designations in this *Zoning Table* and would need to be updated herein.

The following key general themes or concepts for the Florin Road Station area work together to achieve the desired goal of a TOD-friendly development. The key themes are:

- **Forward Looking**
  The Florin Road Station Area concept acknowledges and builds upon the change in activity that will occur when the South Line extension is built. Florin Road Station will shift from a park and ride to pedestrian and shuttle access.

- **Transformative**
  The development concept/program is far different from today's park & ride lot. It is neighborhood-oriented, relates to the communities and land uses that surround the station site, and has a strong commercial component along the Florin Road frontage. The concept extends south of Florin Road in an effort to improve the organization of both retail and residential uses, also making them more pedestrian friendly and more transit oriented

- **Pedestrian Friendly**
  The neighborhood is structured into a pedestrian-friendly design, low-traffic and parking either curbside or behind residential development, screened from the street. Relatively small blocks and interior streets make for safe and well-used sidewalks.

- **Open Space**
  Open-Activated space is a feature with the inclusion of (proposed) Florin Park, green/sustainable streets and other small public spaces ~ including green rooftops.

- **Efficient**
  The intensity of development included in this concept may vary, but the circulation and infrastructure framework can remain as it is—within limits.

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Achieving a TOD-friendly development through the implementation of the concepts presented above will guide the Florin Road Station area in a manner consistent with the long-term vision of the community and the city of Sacramento.

THE FLORIN ROAD STATION TODAY

Auto-oriented and convenience retail land uses predominate along Florin Road near the RT station. Larger regional and destination retail activities that attract shoppers from a wider market area include the Southgate Plaza. Numerous auto-service and rental establishments line 29th Street south of Florin Road and merge into self storage and then four-plex residential farther south. The market update notes that while there is presently no deficiency in regional retail or general commercial opportunities in the vicinity, there is a deficiency of convenience retail including grocery stores, dining establishment, legal services, laundries, and cleaning and garment services, among others.

Figure 2 Existing Land Use

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BACKGROUND

The resident population around the Florin Road Station is comprised of family households with a high percentage of seniors and young people. The neighborhoods east and west of the station are stable single family areas, including a large mobile home park across the rail right of way east of the station. The population is expected to grow steadily and substantially. Some residential neighborhoods, especially just south of Florin Road, include multi-family buildings at the four-plex level. North of Florin Road, small lot single family residential development, including a mobile home park to the east, and considerable vacant land to the west of Indian Lane predominate. In addition, Luther Burbank High School, located about one quarter mile east of the station generates significant patronage at the Florin Road Station.

Since the Florin Road Station area includes 22 acres of land and there is a large vacant area to the west of Indian Lane that is presently undeveloped, the station area is a logical place for a relatively large infusion of new residential development. It is essential that the new development be considered as a whole, both to ensure that it properly serves to generate transit ridership, and to establish the vision of a new neighborhood that relates to the objectives of the existing and emerging communities it will serve. The Florin Road Station transit oriented development (TOD) plan also includes the potential for facilities that will both serve the student population and support extension activities.

The TOD plan for the Florin Road Station aims to provide surrounding neighborhoods, new station area neighborhoods, and the commuter population with community services that are mutually accessible by transit and on foot, such as child care, senior housing and elder care. New residential development should include mixed use options that will add convenience retail and retail services commensurate with the evolving market. Young families that presently live in the area

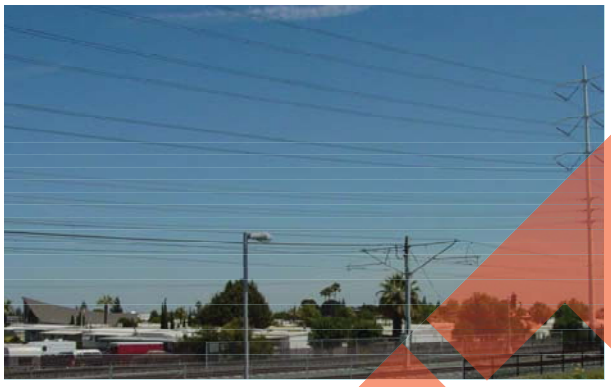

Figure 3 Mobile Home Park to the East

Figure 4 Bus Berths and Station from North

Figure 5 Single Family Neighborhood to the West

Figure 6 Transit Station Looking Toward Florin Road

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around the station, and in the future may occupy TOD mixed use development, will also be the beneficiaries of recreation uses, both public and private that are presently lacking in the vicinity of the station. These objectives were discussed with community members early in the planning process and determined to be of high importance to the community.

GETTING TO KNOW THE COMMUNITY

Two major community meetings were held during the course of the planning process. The first was a workshop, 'piggybacked' on the Farmers Market held on October 3, 2004 at the Florin Road Station site. The second was a meeting of community representatives at the Area 2 Leadership Meeting on July 16 in 2005.

The Workshop

The workshop was well attended and productive. The event was announced well in advance with posters on RT trains and buses, and at RT stations. Over 100 attendees participated at the first meeting. After reviewing the presentation materials and discussing the project with City staff and members of the consultant team, most of the attendees filled out a fact finding and opinion seeking questionnaire. The respondents offered strong support for the TOD process, and offered many specific recommendations for the development program, which have been considered during the subsequent planning process.

Figure 7 Community Workshop at farmers market.

Key points in the response of attendees:

Family Oriented -

- Ensure that this is a neighborhood that serves families.

Seniors -

- Provide for seniors and empty nesters' who have specific residential requirements, and need recreation, shopping and care-giving nearby.

Students -

- Students from the Luther Burbank High School should be considered in the plan. They are major users of the transit station and they require safe passage from the school site, and possibly, an activity center near the transit station.

Area 2 Leadership Group Meeting

The Area 2 meeting was held to present draft plans and discuss direction. At the meeting, the assembled stakeholders were generally favorable with the emerging development concepts. There were three areas of concern expressed:

Encroachment -

- Their greatest concern was that the interface between new development and existing single family neighborhoods must be carefully managed using height limits and buffers of open space to prevent loss of privacy and quiet enjoyment.

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Traffic -

- Increased traffic on Florin Road, and the potential diversion of trips to streets in existing neighborhoods, was also a concern.

Students -

- Some attendees expressed concerns about the large numbers of high school students at the station, with the need for activities when waiting for transit.

TRANSPORTATION FOR LIVABLE COMMUNITIES (TLC) 2002

The Sacramento Area Council of Governments (SACOG) in collaboration with RT, did a study of the potential land use impacts of developing around existing and planned stations which included the Florin Road Station. The intent of the study was to show that SACOG's forecasted regional development could and should be focused where access to Regional Transit was available, and to show how the property owned by the transit district could be used as a catalyst for focused land use investment. The TLC process included interactive community meetings, and the final report showed how much mixed use, transit oriented development could be supported at each site. The land use presumption of the TLC study is that a substantial percentage of forecast growth should be allocated to TOD at transit and rail stations.

TLC Market Study—Updated

The Bay Area Economics report, originally made for the TLC study, and later updated for this planning effort has three conclusions:

- **Potential**

  There is a strong potential for residential mixed use development at the Florin Road Station site. Moreover, in spite of the large big box and strip commercial centers along Florin Road, there is a need for neighborhood serving retail and community services.

- **Uniqueness**

  The 22-acre Florin Road Station site is the largest RT-owned property of any of the stations analyzed in the TLC study. This large site size creates opportunities for transit-oriented development that do not necessarily exist at other stations. While accommodations must be made to meet the anticipated park and ride demand at this site, the site can be configured to meet other community needs in a transit supportive manner.

- **Gathering Potential**

  The neighborhoods in this area lack an informal public gathering spot. The hub of transit activity could serve as a suitable location for such a project. Retail uses at this site should be configured to be convenient not only to the large numbers of anticipated transit riders, but also to the large volumes of drive-by traffic on Florin Road.

TLC Land Use Allocations

The TLC forecast for the ½ mile around the transit station allocated 1,690 new dwelling units in a mixed use configuration that included over 1,090 new employees in retail, commercial, and civic development space.

With that much development, the study projected a 36% increase in rail boardings. The map and notes on the following page summarize the TLC findings. It is interesting to note that the development prototypes shown are three stories or lower. In this TOD study, which recommends the addition of fewer units overall, the development prototypes are very similar, if

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not somewhat denser than shown in the TLC but the overall numbers of units is much lower. One reason is that the TLC study anticipated substantial redevelopment of commercial properties south of Florin Road, which are unlikely to happen in the near term. In addition, the current plan includes over 5 acres of required parkland featuring plazas, greenways and other spaces that will reduce the gross density of development, but was not accounted for in the TLC study.

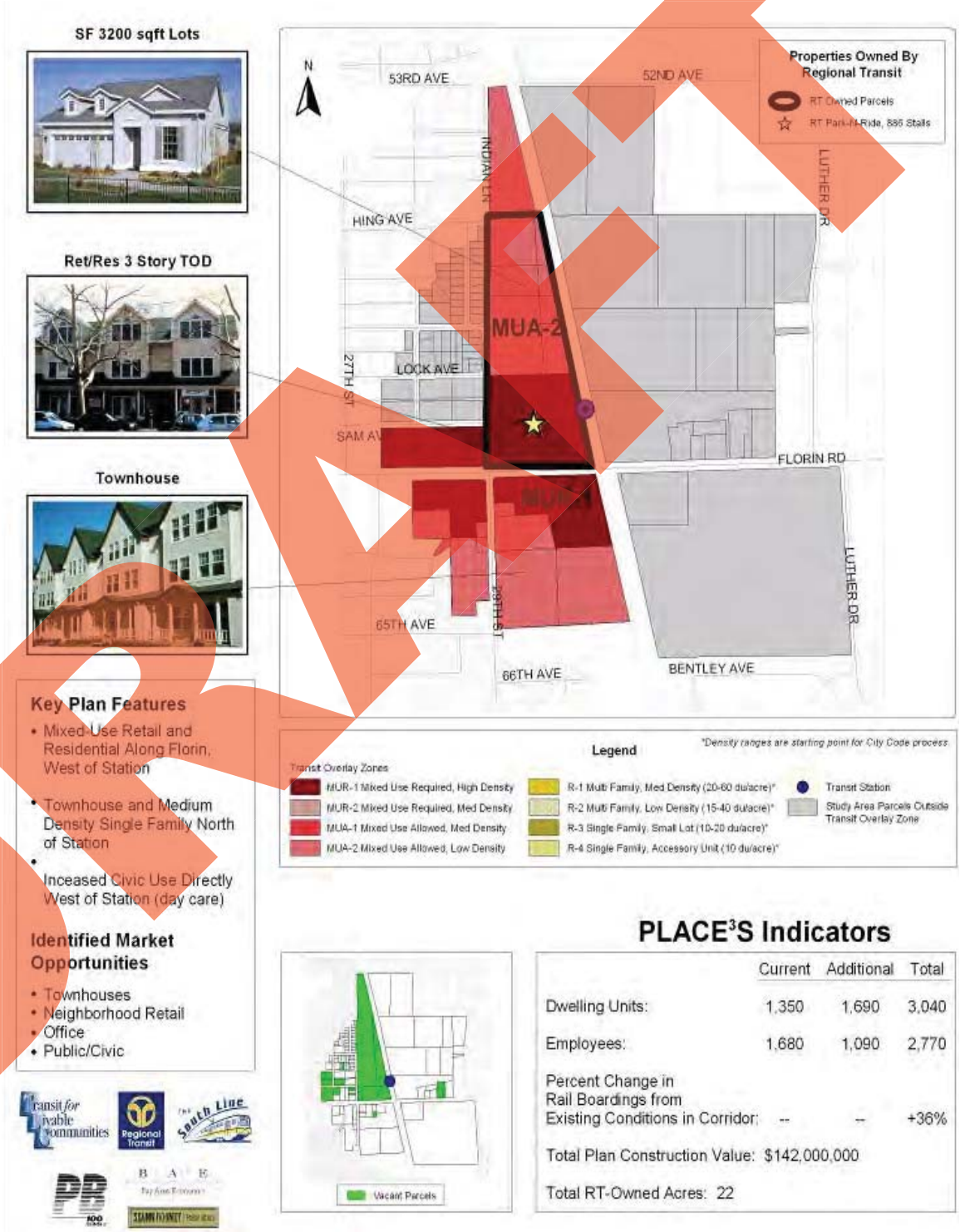

Figure 8 TLC Summary Plan

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OPPORTUNITIES AND CONSTRAINTS

The consultant team worked with City staff to survey and summarize the opportunities represented by existing conditions, RT objectives and community input.

- The property owned by RT and other vacant and underutilized properties within walking distance of the RT station represent a prime opportunity for well planned Transit Oriented Development. There are only about 200 parking spaces used in a typical day by transit riders, indicating that development can be phased without a negative impact to the park and ride, kiss and ride and bus transfer operations, as long as the entrance to the station is kept open and adequate surface parking is retained.
- The station area is large enough to allow for medium to high density development that is carefully tapered to mesh with the surrounding neighborhoods.
- The rail transit line to the east and Florin Road to the south are natural boundaries. These provide opportunities for more intense, mixed use proposals to be accommodated without affecting immediately adjacent sensitive uses.
- There are about 30 acres of vacant or underutilized land within a five minute walk of the Florin Road Station.
- RT owns 22 acres of land at the Florin Road Station which includes 1,078 surface parking spaces. RT has identified this site as surplus property, and is eager to develop a TOD project on its property.
- Additional vacant land, under a single ownership, north of Florin Road and west of Indian Lane, adds about 7 acres of prime development land that is within walking distance of the station.
- Infill opportunities exist south of Florin Road in the strip commercial area on both sides of 29th Street that are within a five minute walk of the transit station.
- Transit patronage will grow commensurate with the addition of a mixed use neighborhood within walking distance of the transit station as both an origin and a destination.
- Pedestrian flow and RT patronage are profoundly influenced by the presence of Luther Burbank High School students who use the transit stop as a meeting place as well as a transportation hub.
- There is a need for community facilities that will serve the commuting population and to support the new families and single occupant householders who will populate new housing at the station. The RT station area and the Florin Road frontage are good sites for well programmed community activities.
- In the longer-term, here is a potential market for new residential development that accommodates families, young singles, and seniors who are employed in the region served by RT, or benefit from transit access to healthcare, education, and recreation.
- One of the development proposals that has been considered for this site included substantial commercial office space, and a multi-plex cinema which suggests another potential element in the TOD program for the station.
- The new neighborhood must be designed to be compatible with its existing neighbors.

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- Development at reasonable densities along Florin Road should include the potential for ground level retail, services and restaurants. Traffic volumes on Florin Road make the market for these land uses, but also make it necessary to consider how to reduce the impact of traffic noise in the new development.
- Indian Lane will remain the only signalized entry to the Florin Road development. It must be designed so that it becomes a safe entry point for pedestrians, automobiles and bicycles.
- Residential and commercial development at the station must be designed to provide for small families and single person households and retail or civic activities that will benefit from proximity to the very active environment around the transit station.

Figure 9 View from Indian Lane to RT Overcrossing

DEVELOPMENT OBJECTIVES

The development program and plan for the Florin Road Station area follow goals and objectives that were set by the community and its elected representatives.

The City's Smart Growth Guidelines recommend that the following be included in plans for the future:

1. Support land use, transportation management, infrastructure, and environmental planning programs that reduce vehicle emissions and improve air quality.
2. Provide a variety of transportation choices for people to bike, walk, take transit or drive.
3. Promote distinctive, attractive communities with a strong sense of place; and
4. Promote mixed use development and city centers.

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These guidelines have been included in various ways in the following objectives for this project.

- **Long Range Point of View**

  This plan is the product of a long and interactive process. It recommends a level of development that will relate to the existing scale of this neighborhood, but it offers options for higher intensity development that may be more compatible with improved transit patronage and the aspirations of the next generation of local residents and elected officials. In addition the plan deals with a large land area, some of it owned by RT, some by single land holders and some small site infill opportunities. Hence, the development will be phased; and as it is implemented, it will respond to emerging markets and community preferences.

- **Adding to Existing Neighborhoods**

  Neighbors of the transit station across Indian Lane, Florin Road and even the RT/Union Pacific Railroad right of way to the east presently experience a barren expanse of asphalt parking for a good part of the day. The TOD plan for the Florin Road Station Area addresses this issue, creating responsive neighborhoods in place of an underutilized parking lot.

- **Responding to Neighborhood Concerns**

  The scale of development is carefully calibrated to relate to local concerns about density and height. The plan is scaled back from the proposed TLC view to address those concerns without diminishing the quality of the TOD plan.

- **Residential Diversity**

  The plan provides residential options responsive to local markets, including housing and neighborhood facilities for families, seniors, and single residents.

- **Market for Non-Residential Development**

  There is a need for community scale retail, office and service establishments to serve the planned and growing residential community around the station. Local serving retail will be included in the new neighborhoods, within a rich and pleasant pedestrian environment.

- **Environmental Justice**

  Individuals who live near the Florin Road Station expressed an interest in accessible shopping, recreation and services, especially related to elder care and child care. The Florin Road Station area will develop during a time when sustainable growth has become an important goal for both local governing agencies and local residents. Obviously, the plan recommends a development that is focused around the RT station, and it provides walkable green links to the station—it is Transit Oriented. In addition, the plan recommends a number of 'green' strategies, ranging from permeable surfaces to increase water retention for the tree cover and plant masses that will both enhance the visual environment and enhance the quality of air. Green roofs provide another source of recycled water and reduced solar radiation. In addition, arcaded main streets and other architectural devices to allow for natural temperature control are recommended in the design standards.

- **Serving Diverse Transit Patrons**

  The plan incorporates a response to the special needs of the students of Luther Burbank High School who need a well marked, controlled access route from the school to transit, and places in the vicinity of the transit station that provide them with opportunities for recreational and support activities.

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- **Public Spaces**

  Following the intent of Ordinance 2004-63, the TOD plan goes beyond providing open space in parks, and plazas. The Florin Road Station Area Plan also includes a network of 'greenways' that are primarily designed as pedestrian links to the central area, parks and the transit station. Development guidelines urge the inclusion of 'green roofs' that can be publicly accessible or may be dedicated to private gardens for individual dwelling units.

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CONTEXT

The plan diagram shows the location and the context of the TOD planning area. As noted previously, the 22-acre station area is surrounded by diverse neighborhoods on the east and west, but Florin Road is lined by auto-serving uses and mini-storage. The traffic along Florin Road is relatively heavy, but there is far more congestion near 27th Avenue at present, than at the entrance to the transit station on Indian Lane. The design challenge is to meet these edges in a way that respects the neighborhoods but also responds to the harsher context of Florin Road. Since the development plan extends beyond RT property it both acknowledges the context of the plan and incorporates its existing elements.

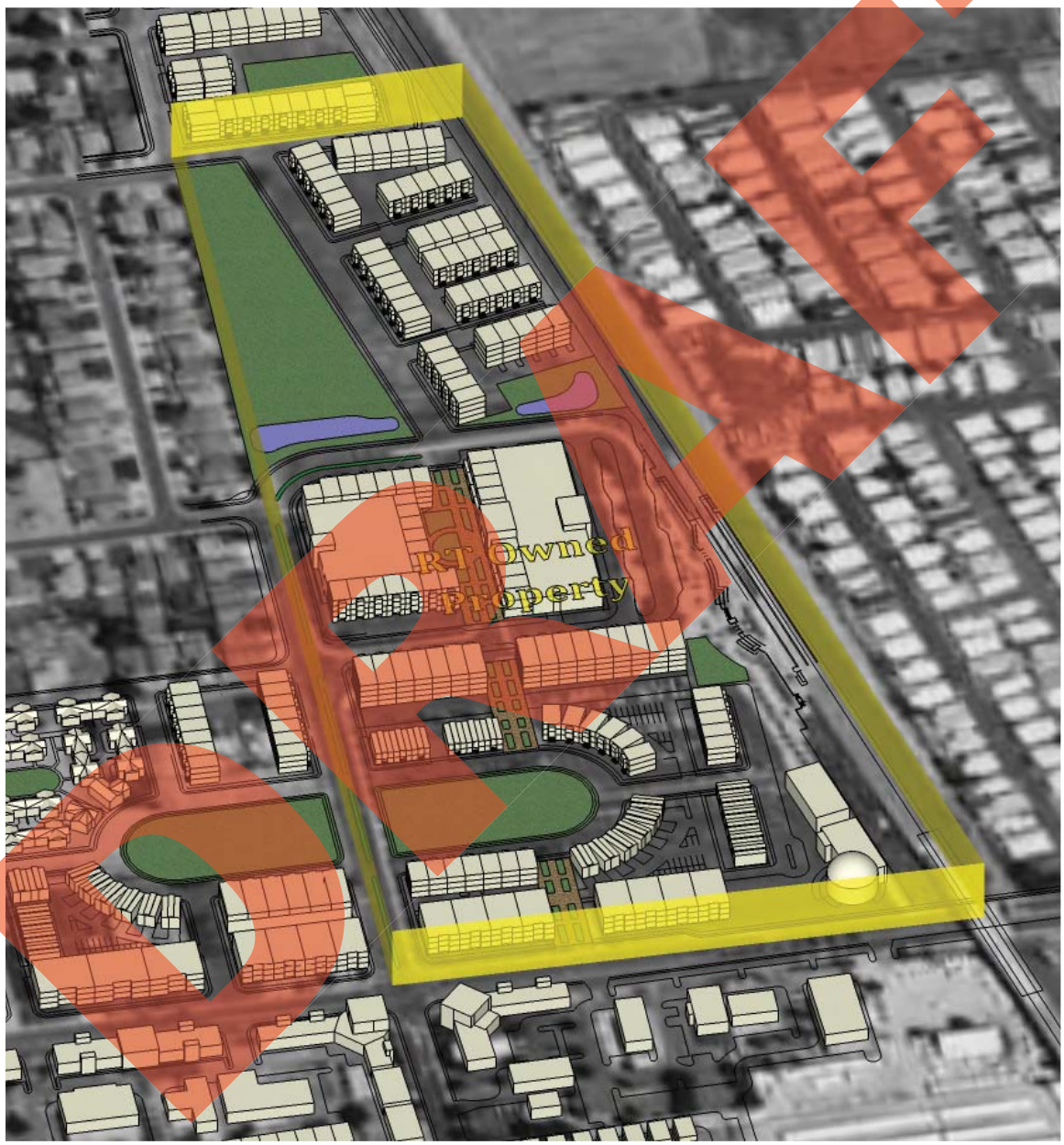

Figure 10 RT Owned Property

The program for development at the Florin Road Station is a product of input from the community and city staff. It follows the objectives and market study data noted above. The

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overall development program addresses almost 56 acres in total; 22 of which are RT owned. The development perimeter is roughly ¼ mile (a five minute walk) from the RT station. The program includes a substantial 8 acre residential development (town houses and duplex residences) west of Indian Lane and an infill strategy for the largely commercial and vacant acreage south of Florin Road.

Several alternative plans were considered and parts of each were incorporated in the final version. The preferred plan incorporates the goals and objectives cited previously, as well as those generally accepted for successful transit oriented development (TOD).

LAND USE CONCEPT

RT Property

The program for development of the 22 acres of land on the RT site is primarily dedicated to residential and mixed-use residential development.

About 7.4 acres at and around the station (including the bus and kiss-ride facilities) may be occupied by mixed use development integrated with an RT parking structure that would replace 100 to 200 of the surface parking spaces (based upon existing utilization figures). Residential and commercial uses may be developed immediately adjacent and/or over the station/parking and the base of the parking structure is envisioned as a site for civic or retail uses. Successful examples of this type of mixed use development are cited in the design guidelines

If the demand for park and ride mode of access to the Florin Road RT station is further reduced when the South Line Phase 2 is built and the TOD community around the RT station is large enough to generate substantial ridership, RT may decide that the footprint of the parking structure in this plan could be wholly dedicated to a mixed use commercial and residential project. In order to ensure that this option is not precluded, development in the RT station area should begin in the southern part of the site, along Florin Road, preserving enough surface parking at the station, and north of it, to serve immediate ridership needs until the South Line Phase 2 is completed and future parking needs at Florin are better understood.

Contiguous Properties

Development on the largely vacant properties within 1/4 mile of the station that are not owned by RT, such as the large parcel west of Indian Lane, reflect much the same programmatic content as the RT owned land with a heightened sensitivity for the need to blend into existing neighborhoods.

Since there is substantial existing (commercial) development south of Florin Road, the development program integrates infill residential and recommends a reorganization of the strip commercial to improve the visual impact of these uses along the road, and to make them accessible to pedestrians and more related to the form of development across the road. Redevelopment of the area through either public or private (or in partnership) would be required to assemble the parcels necessary to make this happen.

The redevelopment of the south side of Florin Road may occur as a natural extension of the urbanization of the RT station area site, with a resulting rise in property values. Development may, however, require some public intervention to assemble parcels and provide development standards that will support the efforts of the landowners and the private development community.

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In a (long-term) strong real estate market, rising land values will support the replacement of strip commercial development with more intense development and more productive mixed use products.

NEIGHBORHOODS AND SUB-NEIGHBORHOODS

The end product of the planning and development process should be a vital, lively neighborhood. It should be made up of sub-neighborhoods that can accommodate variations in family size, time of life, and provide a variety of recreation, entertainment, and urban amenities. In the following diagram, the sub areas of the neighborhood are defined according to:

- Proximity to the RT station
- Access to parks and open space
- Proximity to Florin Road
- Contiguity to existing neighborhoods
- Residential density
- Household size

Realistically, it is not possible to predict the age, family make-up, and employment of the individuals and families who will live in the Florin Road Station neighborhood. But the diagram is an effort to explain the different qualities of the residential environment as envisioned.

Single Family Townhouses (Map Key: L)

This area is mainly fairly large townhouses. Because of its northerly location and proximity to other neighborhoods, it is envisioned as a place for empty nesters, families with children, and extended families. There are some mini parks in the land use mix to provide recreational opportunities within a very comfortable distance.

Sports Park—Active Families (Map Key: J and K)

This area between the sports park and the transit line is a good opportunity for apartments or condominiums, hence some higher density, mixed with townhouses and flats. Again, a place designed for families and active adults.

Single Workers/Small Families (Map Key: I)

Directly across the greenway from the RT station, this district is comprised of small townhouses, and condominiums at a scale that blends with the neighborhood to the west, but with the kind of accommodation that more suburban garden apartments provide. Typical residents might include new families and single-parent households.

Platform Adjacent Mixed Use (Map Key: I)

The RT station is envisioned to have a small parking structure to serve park and ride traffic. The garage can be the base for loft houses for families and individuals who want convenient access to transit. The lofts can open onto a green roof atop the garage. The base of the garage can be a relatively high space that could be used for community recreation or a multiplex cinema, or an indoor sports venue.

Park Side – Lower Density (Map Key: B)

This property, west of the RT owned land, is a good location for larger houses, including duplexes and townhouses. The families that live here will be in the context of the existing neighborhood and will have direct access to the Florin Park.

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Park Side – Higher Density (Map Key: F)

On the east side of Indian Lane, the residential mix can include both apartments/condos and town houses, and because of the direct access to the RT station and to Indian Lane, this could be a neighborhood for seniors as well as families with children.

Infill Commercial/Residential Mixed Use (Map Key: M, N, O, and P)

On the south side of Florin Road, and on both sides of 29th Avenue, and consisting of highly mixed uses at present, this area will be an expansion of the four-plex and commercial environment that presently occupies part of the land. While the area consists of highly mixed uses at present, the development guidelines should be enhanced to require continuous retail frontage and fewer parking lots on Florin Road.

Civic Center (Map Key: G)

At the southeast corner of the RT property and on the main path between Luther Burbank High School and the station, this site is well suited for a civic use—teen center, day care (for transit station patrons) elder care, or simply a place for neighborhood meetings and the headquarters of a neighborhood market. Moving north toward the RT station, a triangular plaza could be paved and landscaped to add to the sense of 'place' and provide the location for the Saturday Market that presently utilizes some of the RT parking lot.

'Main Street' (Key Map: A, E, and G)

There is an opportunity to blend apartments and town houses, or local serving office space, above street level retail along Florin Road, in a manner that provides a public/private edge to the new Florin Station Neighborhood, and provides places to work, shop and meet for people in the entire TOD area. In other situations, the apartments or townhouses over the street have been prime locations for empty-nesters to relocate, perhaps taking advantage of the commercial services, the medical offices, and the presence of other family members in the development to the north.

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Figure 11 Neighborhoods and Sub neighborhoods

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RT TRANSIT OPERATIONS AND PARKING

RT envisions the potential to reward TOD residents, kiss and riders, and bus transferees with a thriving and useful environment at the station itself. If there is a substantial growth in demand for parking for commercial uses and for higher intensity residential development near the station, the parking structure, with mixed use development and community facilities shown in this TOD plan, could be dedicated to those uses. All users would pay for parking and all spaces would be self amortizing.

It is assumed that RT's property will be developed in some form of mixed-use. These guidelines envision that RT parking will be housed in a single structure, sized to relate to anticipated RT parking demand (roughly 110 parking spaces), adjacent to the existing RT light-rail station. The parking structure may have an additional level, to provide parking for the public recreational uses that are proposed to be developed in the base of the parking structure. As noted above, the bus-intermodal and the kiss-ride access to the station will be retained as is. Pedestrian access from the southeast corner of the site, particularly from Luther Burbank students, and from all other quadrants of the TOD development will be along neighborhood streets, greenways, or linear pedestrian plazas.

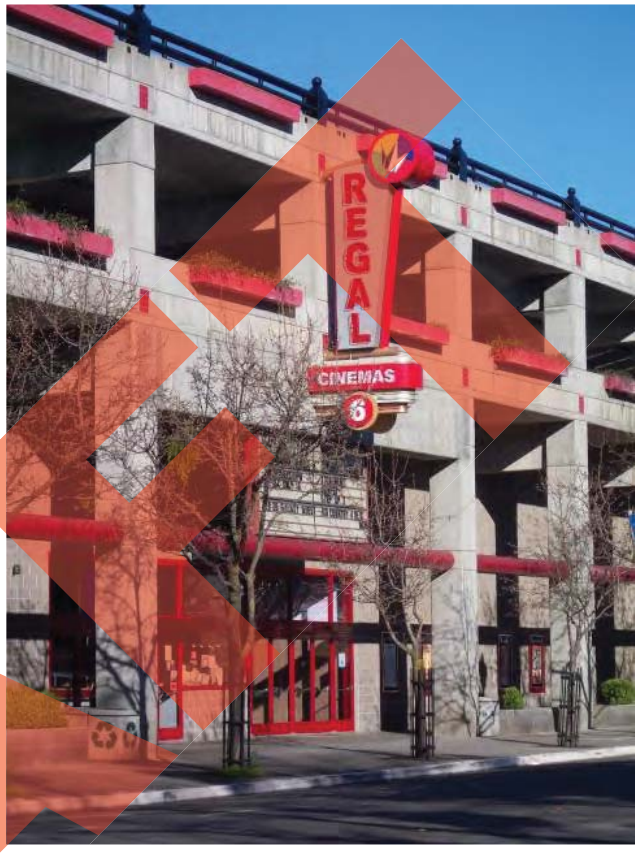

Figure 12 Cinema with Parking Above

Figure 13 Grocery with Parking and Housing Above

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VEHICULAR CIRCULATION

The TOD plan is based, in part, upon an assessment of the existing street system and future vehicular needs.

- In 2005, Florin Road carried 31,000 ADT and is projected to carry 40,000 ADT by 2025 on four lanes at the present 40 MPH speed limit. The traffic analysis notes the need to improve the geometry at the 29th Street/Indian Lane intersection, the entrance to the site, to meet future non-project needs..
- Nearby Florin Road intersections that will be impacted by the TOD development at the station will be at or above LOS E. This is anticipated to be an acceptable level of congestion in transit village areas, under the Draft General Plan 2030 expected to be adopted by the end of 2008.
- The traffic study notes that future traffic would be reduced if the development achieves a good balance between residential and commercial uses.
- The traffic study also notes that the driveways that serve commercial uses south of Florin Road in the station area should be consolidated, and should be restricted to right turn only operation.

The TOD Concept and Guidelines Plan adds a network of streets designed to serve the emerging mixed use neighborhood with as little impact on the existing network as possible. The street and pedestrian network divides the area into blocks that are well-suited to moderately dense neighborhoods, and that make it desirable and attractive to make daily trips to school, to shop, for access to recreation and work opportunities by walking or transit. This is done by providing opportunities for all of those activities to occur in the plan, and by recommending development at a density that will support them.

The following figure illustrates the five types of "streets" that would be developed as part of the Concept Plan for the Florin Road Station. Cross-sections of each street concept follow this figure. A brief description of each street type is noted below:

- **Section A:** This illustrates a typical four-lane street with on-street parking, a median and relatively wide planter areas/ped area on the sides. This is the main street serving the Florin Road Station site.
- **Section B:** This street type would access the parking garage discussed previously and consists of a mixture of one or two lanes plus parking and bike lanes.
- **Section C and C':** These street types are "Neighborhood Streets". As such, they are one-lane in each direction plus bicycle lanes.
- **Section D:** "Park Neighborhood Streets" are one-lane in each direction plus on-street parking.
- **Section E:** Section E shows a "greenway" and is not a public street. Rather it serves as both a unifying element for the development, as well as providing both pathway and recreation space for the residents of the area. The greenways would allow for emergency access, maintenance, etc. Maintenance of these greenways would occur through some sort of private and/or public mechanism to be developed as part of the development application itself.

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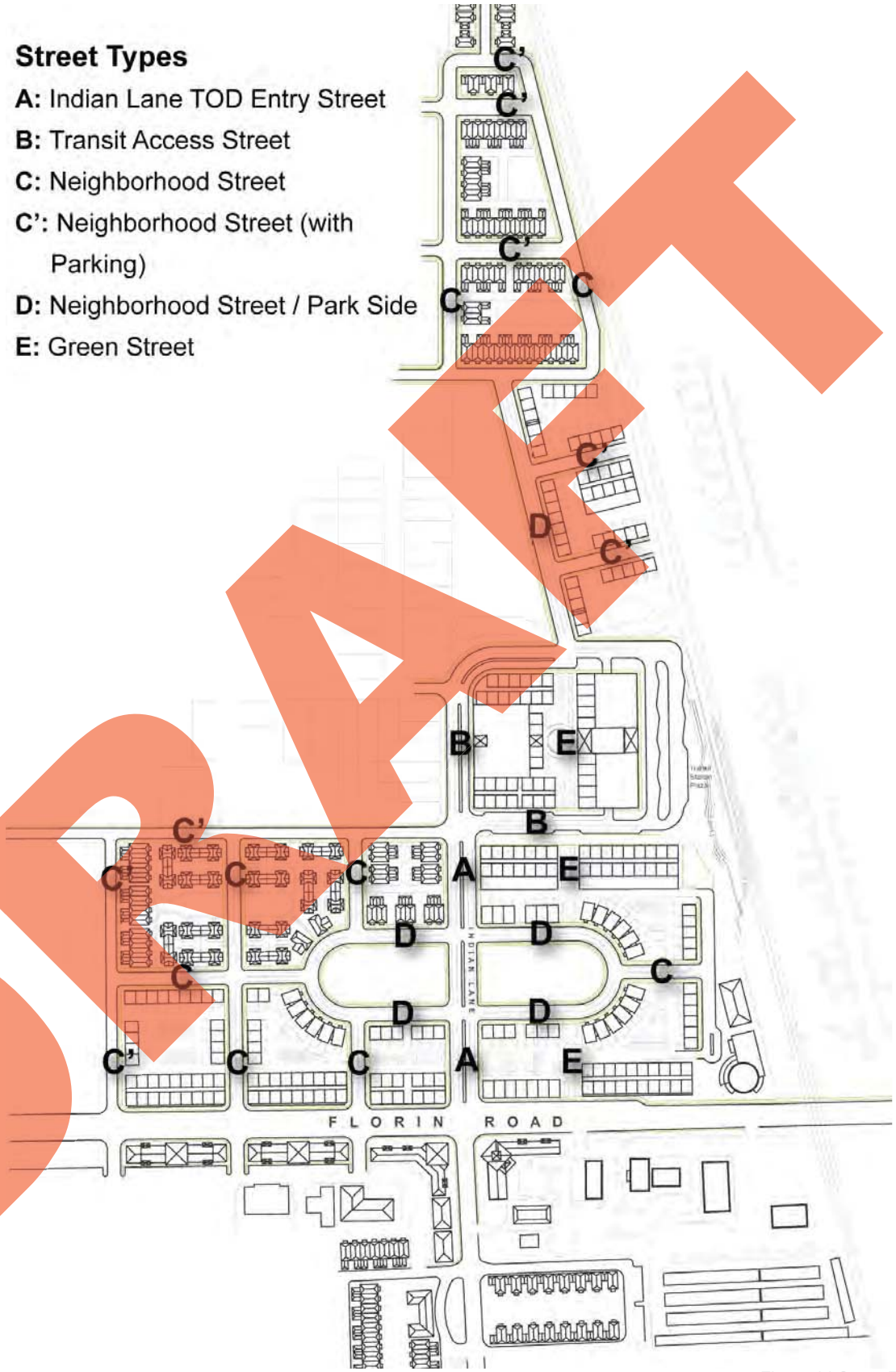

Figure 14 Street Types

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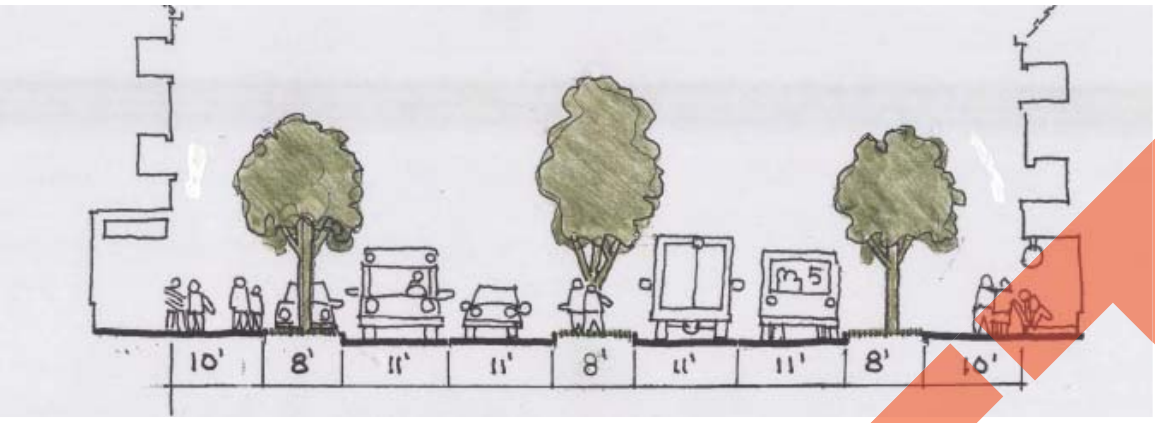

Figure 15 Section A - Indian Lane Access from Florin Road

Figure 16 Section B - Transit/Park and Ride Garage/Intermodal Access Street Park

Figure 17 Section C - Neighborhood Street

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Figure 18 Section D - Park/Neighborhood Street

Figure 19 Section E - Greenway

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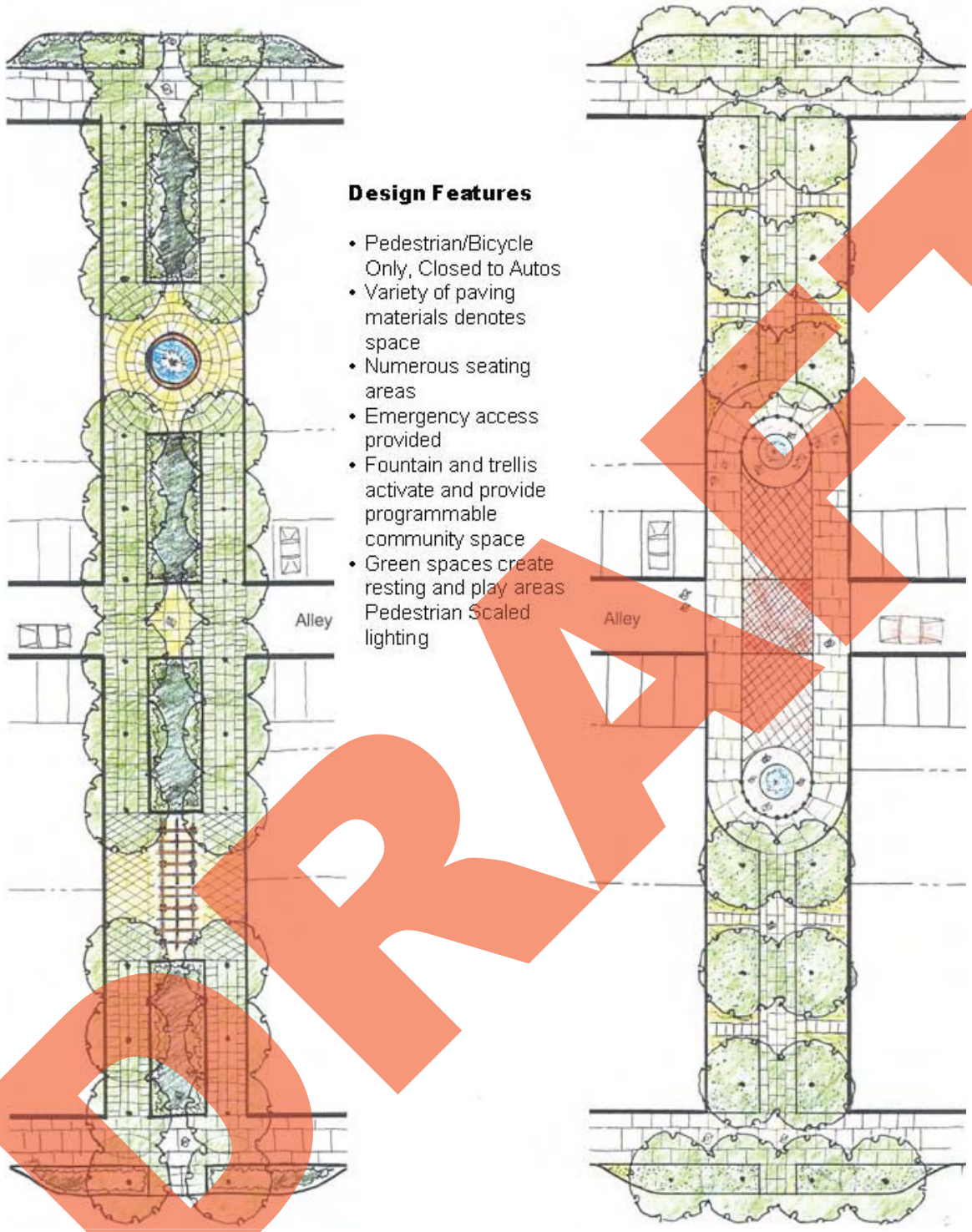

Design Features

- Pedestrian/Bicycle Only, Closed to Autos
- Variety of paving materials denotes space
- Numerous seating areas
- Emergency access provided
- Fountain and trellis activate and provide programmable community space
- Green spaces create resting and play areas Pedestrian Scaled lighting

Figure 20 Sample Greenways

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PEDESTRIAN/BICYCLE CIRCULATION

An objective of the TOD plan for the Florin Road Station area is to design every neighborhood to encourage free and safe pedestrian and bicycle activity. The design of the streets, sidewalks and pathways and pedestrian crossings must ensure the safety of pedestrians and bikes to encourage these trips. The ped/bike network exists as follows:

- There are sidewalks on both sides of Florin Road, but they vary in width and capacity. There is only about a two foot clear sidewalk where the supports of the transit overpass are located. This is the would-be route of pedestrians from Luther Burbank High School. The traffic study notes that there is a need to widen pedestrian sidewalks (to 12') on the north side of Florin Road, and that hazardous crossings from the south side of Florin Road near the transit overpass need to/should be prevented by installing a barrier in the median.
- There are presently no bicycle lanes on Florin Road in the vicinity of the station.

The TOD plan shows a network of streets that establish an urban block pattern. The block size varies in size and shape, but the pattern ensures that traffic will move slowly through the area, and pedestrians will be able to cross at intersections with safety and ease. The pedestrian circulation plan also includes 'greenways' that facilitate safe and comfortable movement through the area. These streets will permit emergency access for vehicles as well as access for maintenance vehicles when necessary. The TOD plan recommends that each crossing be analyzed and designed to meet these objectives. As an example, the section of Indian Lane that divides the proposed Florin Park into two parts is an area of special concern because of the potential for substantial foot traffic between the two halves of the park. The section in the Parks and Open Space discussion on page 27 shows one response to the issue. The recommended solution is a paved berm along the street frontage in the park, which is planted and illuminated, and could include benches along its perimeter.

The following recommendations emerged from the infrastructure analysis and represent a range of solutions for pedestrians and bicycles:

- Widen the sidewalk on the north side of Florin Road adjacent to the Florin Road Station. The existing sidewalk (approx. 4 to 5 feet wide) along the Florin LRT Station frontage should be widened to at least 12 feet (15' if feasible). This width will accommodate the increased pedestrian activity in the area associated with the TOD. It will also provide an opportunity for bicycle travel (i.e., a bike lane is not provided on Florin Road), thereby making this path a joint use bicycle/pedestrian facility.
- Widen the sidewalks under the LRT overcrossing to 12' if possible.
- Install within the Florin Road median a wrought iron fence (with pointed posts) and/or thorny/dense landscaping to physically discourage pedestrian crossings
- Add signage to Florin Road to direct students to the pedestrian traffic signal.
- To the extend possible, add bicycle lanes on site and bike racks at strategic locations in parks and other high attraction areas.

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GREENWAYS

The concept of 'greenways' has become a standard planning and urban design concept around the world. In the 20th century, it was formally recognized in northern Europe; many specific attributes related to the design of greenways are recommended for inclusion in the Florin Road Station Concept Plan. Greenways feature a variety of paving, landscape, water features, and lighting that emphasize the intimate scale of pedestrian activity, particularly accommodating children and seniors.

In the Florin Road Station Concept Plan, there is a north/south axis that extends from the large open space on the north of the proposed new pedestrian-oriented community, to the southern boundary of the principally residential area in the plan. This north/south axis intersects with an east/west axis that connects the westerly residential neighborhood to the RT station and through the base of the proposed RT mixed-use platform and adjacent parking structure. Combined, these 'greenways' link all of the new developments, as well as the existing neighborhoods on the west side of the development site. The greenways are 50 feet wide, with a 20'-26' linear active space at the center, and a protected 12'-15' pedestrian walkway on both sides.

The figure below depicts the general location of the greenway concept for the proposed Florin Road Station plan area. The figure 20 illustrates two "typical" concepts – a more hardscape oriented example and a more greenscape example.

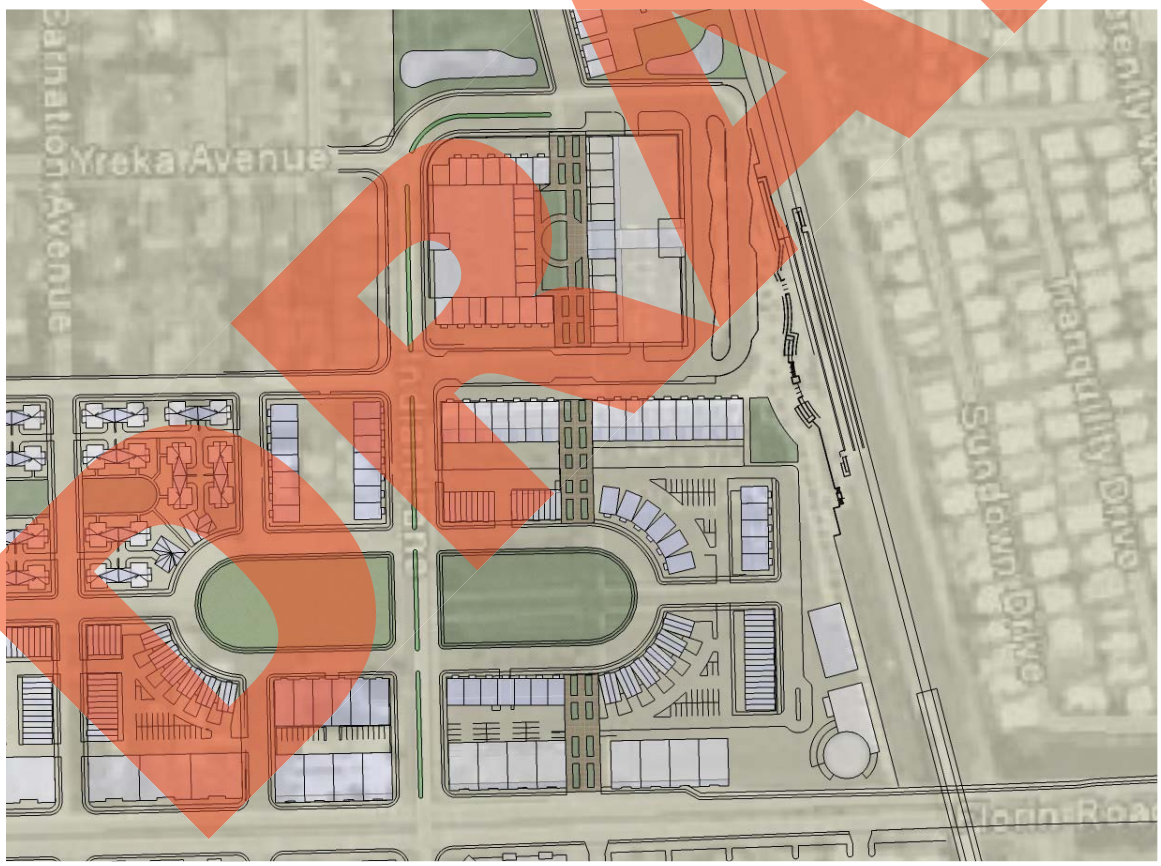

Figure 21 Greenways

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PARKING RECOMMENDATIONS

Parking is provided on site and at curbside for all residential units except where multi-story units in the vicinity of the RT station and near Florin Road require structured parking. Parking ratios specified meet minimum City of Sacramento standards for transit oriented residential or commercial development, and parking spaces are either at-grade and uncovered, or below structures. No subterranean parking is included in this plan, because the density of development and land costs do not support that level of investment. Much higher density development and particularly high density mixed use development along Florin Road would be required to justify subterranean parking.

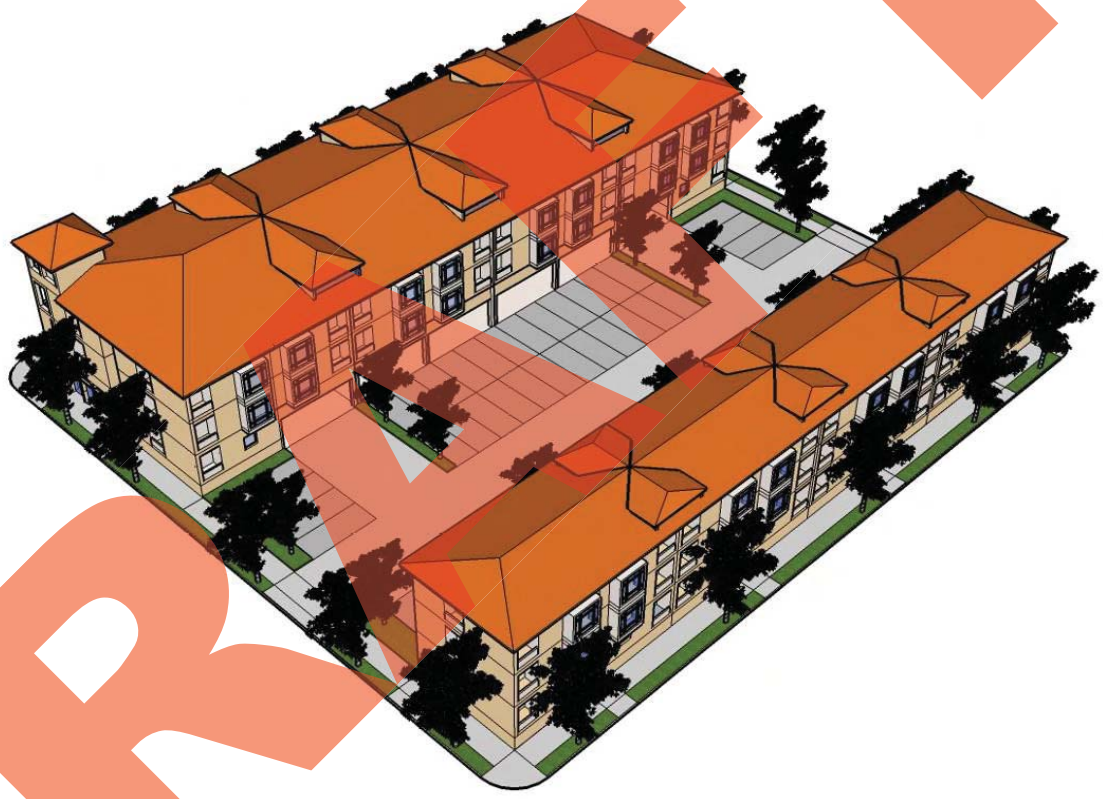

Figure 22 Example of Mid-block Parking

Residential Parking

Typical double-loaded block with mid-block and curb side parking. The parking spaces in the mid block may be exterior and/or below the rear of apartments/condominiums as in the example above.

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PARKS, OPEN SPACES, COMMUNITY FACILITIES

The Sacramento Department of Parks and Recreation has recently provided guidelines and incentives for "Small Public Spaces for Sacramento" that have been incorporated into the plan for Transit Oriented Development in the Florin Road Station area.

> *"Small Public Places are small neighborhood parks and plazas from 5 acres to 1/18th of an acre in size, located in designated high-density areas and park deficient neighborhoods throughout the City. Small Public Places will be an added component of our City-owned park land, and are intended to provide relief from the hardscape and intensity of City-life serving as positive places to gather and recreate where land is in short supply." (City of Sacramento Department of Parks and Recreation web site. Updated 2/20/08)*

In meeting notes from the Parks and Recreation Commission in May of 2006, the City of Sacramento's goals for Small Public Spaces are made explicit. These notes can be summarized as below:

- Provide for active uses including small dog parks and small sport court areas.
- Include public art
- Farmers markets are a way to attract people to underused spaces
- May be developed in partnership with developers and the community
- City is not reducing its overall 'Quimby' requirements, but staff proposes a goal of 2.5 acres /1000 residents on site and remaining requirements (2.5 acres) to be met other ways.
- In addition to the designated park space in the TOD concept, the linear park spaces (greenways) add space for passive recreation, pedestrian walkways and quiet areas.
- Take advantage of land that is already in the public realm through the joint-use of drainage facilities and corridors designed as greenways.
- Create multiple uses in the public realm, including all scales/sizes
- Tot lots sometimes get more use than open field areas
- Include hardscape in design
- Use Rooftops
- Provide for the recreational needs of teens in site design

The Florin Road Station TOD plan includes two parks; one that is the center feature of the neighborhoods south of the transit station, called 'Florin Park'; and one that lies between the new neighborhood north of the station and the existing neighborhood to the west. The northern park is best suited to active sports such as "bantam" soccer and softball, and the shape of Florin Park will offer space for playgrounds and passive recreation for families. Together, the two parks provide over 5 acres of land which is the amount of neighborhood park land prescribed by the City Parks and Recreation Department for TOD areas (2.5 acres/1000 new inhabitants). In addition, the plan includes green roofs, public plazas and a continuous fabric of street landscaping to create an open, park like environment – adding to the minimum neighborhood parks requirement.

Florin Park

This oval shaped 'town park,' will be surrounded by townhouses and flats, and will be a center of active play for families and children, as well as a quiet place for seniors and others. At the center of the proposed neighborhood, this facility will accommodate active and passive recreation and relaxation. It will also be the symbol of quality for residents and visitors. It can accommodate play centers for children, small groves of trees and gardens for seniors and others seeking a quiet outdoor respite, and special events and holiday gatherings. It is important that the

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landscape and paving be designed to collect and recycle surface water, and use fountains and pools, if possible to enhance that option.

Where Florin Park is divided in two by Indian Lane, there will be elevated landscape features on both sides to provide acoustical and visual separation from moving traffic. The other function of the elevated landscape berms (which may be faced with stone) is to channel pedestrian crossing traffic to the intersections and prevent efforts to cross Indian Lane in a hazardous mid-block manner. The section below shows how this will be accomplished.

Figure 23 Indian Lane Section with Protective Berms

Park programming is essential to the appropriate use and activity at Florin Park as well as the other open spaces provided in this plan. The transient environment that exists around light rail stations warrants special attention to the use of open spaces to discourage loitering and unacceptable conduct towards patrons, residents, and workers. While final determination of the programming will occur with the aid of the Parks and Recreation Department as open space is dedicated and constructed, the following are some suggestions for how active open spaces can be established at the Florin Station:

Figure 24 Water Features

Figure 25 Playgrounds

Figure 27 Public Gatherings

Figure 26 Farmers Markets

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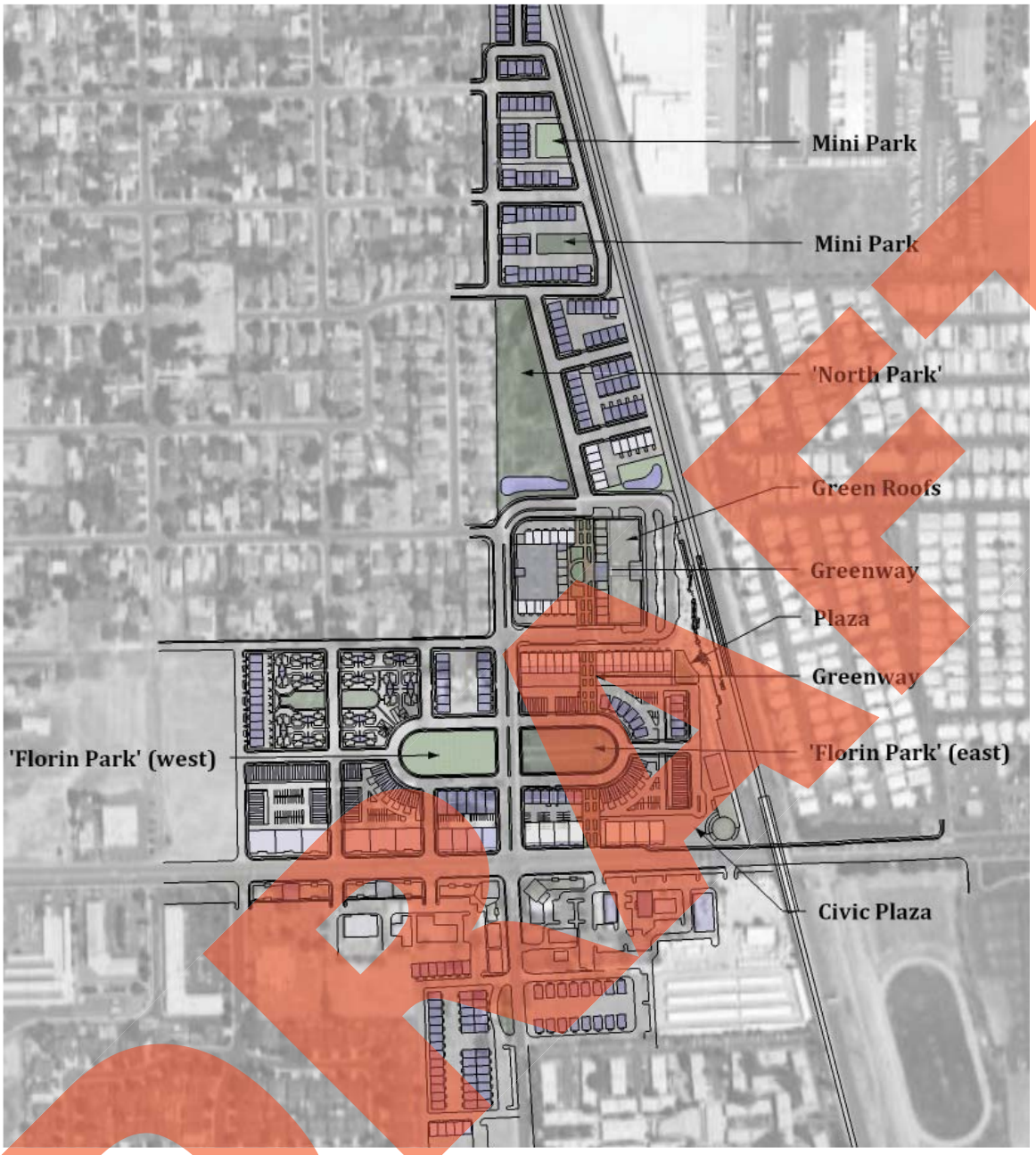

Figure 28 Parks and Open Space

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PARKS, OPEN SPACES AND COMMUNITY FACILITIES

Community/Civic Center

In addition to the two large parks, the plan recommends a public plaza along the east side of the neighborhood, which is an extension of the transit station south to a site that may become an "activity" center for transit patrons. The exact size of the structure and the program are left to the community and the City to determine. It is a crossroads site that is visible from the transit station, and very accessible from Florin Road, the nearby Luther Burbank High School as well as from existing and proposed residential neighborhoods in the planned development. The community center site can be expanded to the west, into the commercial development zone if the community center program grows. The community center may also be expanded with a public plaza, to accommodate more surface open space and play yards for the surrounding neighborhoods.

Figure 29 Daycare Facility

Figure 30 Seniors Center

North Park ("J")

The park proposed north of the station and east of the existing neighborhood will be buffered from the neighborhood by a pedestrian trail within the park along the westerly edge. Pedestrian level illumination, activity sites, water features and other features that the community says will make it a greater asset should be added. This park could be the place for team sports and neighborhood contests. Even though it is not super-sized, it provides enough space for outdoor basketball, softball and little league sports, like soccer and baseball.

Figure 31 Well Lit Pedestrian Edge

Entertainment Center ("I")

Envisioned as two buildings divided by a courtyard/mall and located in the base of the parking garage, the design would encourage the pedestrian movement from the neighborhood to the RT station through the use of unobstructed views, appropriate lighting and opportunities to activate the space. The street level, pedestrian friendly spaces must be an active part of the transit village environment. The plan encourages development of facilities that would be responsive to the market for community entertainment and (commercial) recreation that follows the concept included in one of the TOD proposals submitted to RT for the Florin Road Station area. The

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ground level of the RT parking garage could house a multiplex cinema (with parking above as in downtown Davis); or it could be dedicated to sports activities such ice skating or bowling. Such uses are combined with a children's center with a park and exhibition building in Yerba Buena Center in San Francisco. Another extremely common use of this type of space is for a fitness center.

Figure 32 Ground Floor Entertainment Center

Partnerships

The Community Center and the Entertainment Center concepts offer a unique opportunity for the City, Sacramento Unified School District, and Regional Transit to collaborate and create community space opportunities which reflect the value of proximity to a transit station. The developer(s) of the TOD area are also logical participants in such collaboration to add facilities that will make the project more marketable because they represent an asset for community living.

Sustainable Streets

Open space is incorporated into the street rights-of-way, several neighborhoods are planned along greenways, or living streets. More open space is recommended in small plazas that relate to commercial and public uses, and it is on the roofs of large structures, making them more energy efficient as well as providing an opportunity for play courts and other outdoor activities

The development framework will accommodate a range of development programs. The ultimate decisions about what kind of transit oriented residential neighborhood should be built in the Florin Road Station area will be made by the City of Sacramento, the residents of nearby neighborhoods, RT, and the developers considering the prevailing market at the time of actual development. The illustrative plan is integrated into the framework of streets, pedestrian circulation, open space and civic or public spaces to show how one development program 'fits.' The same framework remains functional, providing access and amenities for the community, at somewhat higher intensities as discussed later.

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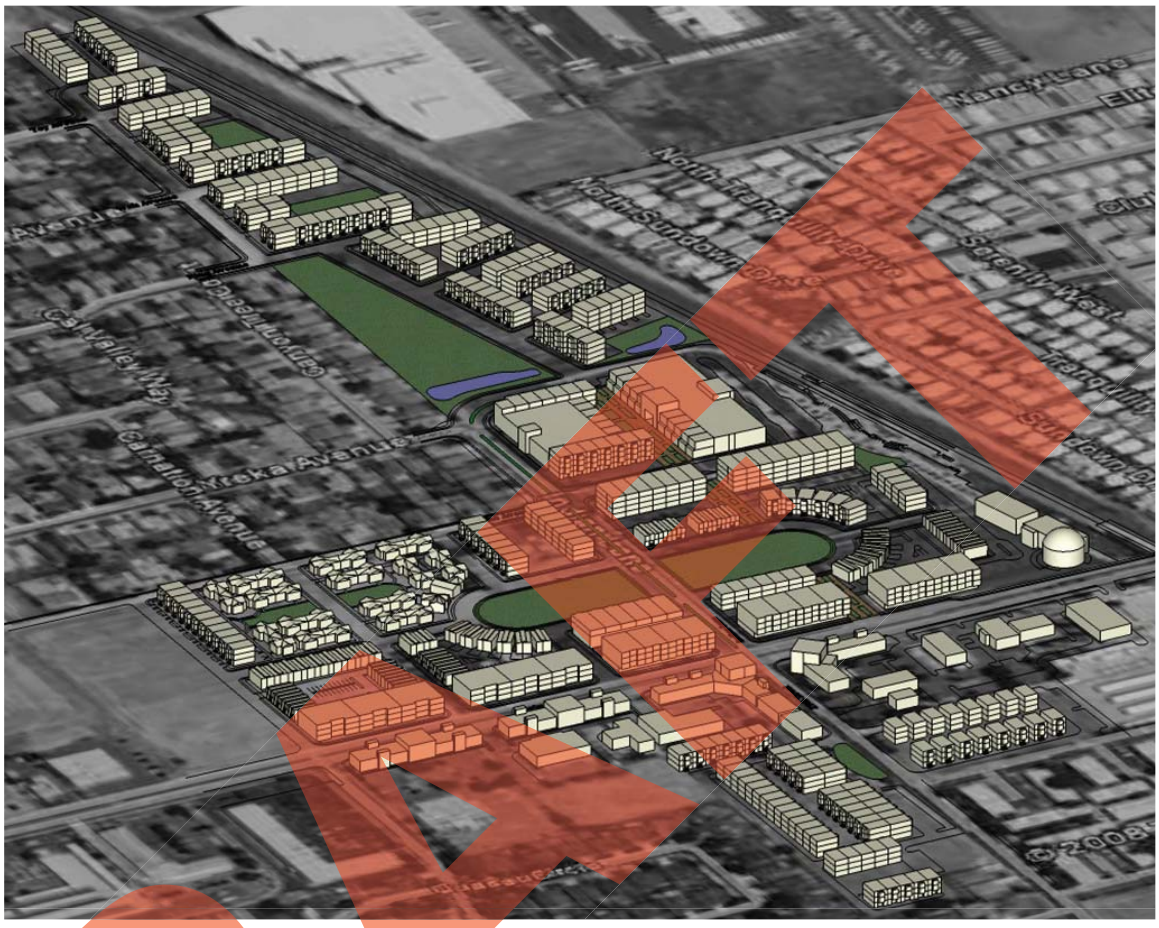

Figure 33 Illustrative Development Framework

Figure 34 Station Platform Detail

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DWELLING UNITS

The number of dwelling units built on the sites around the Florin Road Station will ultimately be determined by the prevailing market at the time of development, and by discussions between the property owners and the public agencies that have jurisdiction over land use. RT has a special interest in medium to high density residential neighborhoods within walking distance of its station. Neighbors and advocates of 'traditional' neighborhoods support small lot single family development. RT will issue a Request for Qualifications for projects. The proposals will be evaluated to determine which of them is most responsive to RT's desire to increase transit ridership (concentrated residential development) and to reduce the need to drive (combined with retail, restaurants, and services). The successful plan will also provide a reasonable level of return and revenue to RT. This TOD plan recommends neighborhood development concepts that would meet RT's requirements.

The program shown in Table 1, Land Use Table, is responsive to currently prevailing market conditions, and to the goals and objectives of the community and the elected officials who represent them. There are two versions of the program in the table.

Base Development Program

The 'Base' program carefully meshes the building types into the fabric of the existing residential development. Along Florin Road, medium density apartments/condos over (some) retail development is proposed to relate to the roadside environment, and on the west, north and east sides of the development plan, the plan is for a careful integration of lower intensity house types that will provide a welcoming environment to families of all types.

Maximum Development Option

The 'Max' column in the Development Program table demonstrates that the development framework can support a higher intensity development program. The Max program substitutes more medium density apartments/condos within the community, especially near the transit station, where more transit riders might settle. 'DU Max" adds a six story structure above the RT parking structure. In the interest of serving a potential market, and for increasing opportunities for putting transit riders in close proximity to the RT station.

The Max program does not change the intensity of development along the eastern and western edges where the new neighborhood interfaces with existing residential areas.

The base development program includes these distinctive housing types. Prototypes are shown following these descriptions.

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Townhouses

This is a standard dwelling type that provides an alternative to the small lot single family dwelling type that predominates in the neighborhoods surrounding the station area. Townhouses can be varied to accommodate two bedroom, (one bedroom and a study) or larger accommodations for families of varying sizes. They occupy a relatively small footprint, even though they generally include one or two parking spaces at grade behind the unit.

- The typical townhouse is a two story unit that is entered a few steps above street level. Some townhouses have a small garden court in front to buffer them from the sidewalk. The design of townhouses varies widely in existing prototypes, depending upon whether they are on neighborhood streets or on collector or arterial streets.
- Townhouses are typically in continuous rows along neighborhood streets, and are sometimes referred to as 'rowhouses,' particularly in eastern U.S. cities.
- Townhouses may be one to three bedroom condominiums or rental apartments.
- Street level apartments have set-back and elevated entries with canopies and/or roof projections

Townhouses over Flats

The two units together create a three story environment with the potential to house extended families or to provide home owners with a rental option, or a single story unit that may be sold as a second condominium.

- The townhouse is the two or three story unit above the street level apartment or condominium.
- It usually contains one to three bedroom apartments or condos.
- Street level apartments have set-back and elevated entries with canopies and/or roof projections.

Medium Density Apartments/Condos

These may be viewed as stacked flats around a single entry, rather than units that are arranged along long corridors. The square footage can be varied, and some apartments may be large enough to accommodate two and three bedrooms.

- Three and four story buildings which may be built as condominiums or rental apartments are a very popular aspect of TOD development.

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- There are a variety of ways to achieve medium density residential development and these represent a flexible alternative.
- They can be aligned along the edge of parks, or clustered around mini plazas.
- They represent a good alternative to meet the growing market for 'empty nesters' and young singles or small families.

Medium Density Apartments/Condos over Retail

Florin Road is an auto-oriented retail environment. The Florin station area neighborhood is designed to make shopping a pedestrian friendly activity, both for its residents and for other shoppers who may walk from adjacent neighborhoods/ employment centers. This vertical mix reflects the fact the ground floor retail has often been combined with apartments to create a highly urban mix of activities. The double loaded apartments extend over some covered parking spaces behind the retail and additional parking is permitted at grade behind the buildings. Depending upon the size of the market, these units might be concentrated along the Florin Road frontage at the major intersection at Indian Lane or they might extend farther along Florin Road.

- This is a commercial-residential mixed/use prototype.
- The ground floor commercial is higher (14-24') floor to floor.
- Retail should be set back or arcaded to accommodate the relatively hot Summer climate in Sacramento.
- Shop windows should occupy most of the ground floor façade.
- Entrances to apartments are near the ends of the block, or in a distinctive tower at the center.

Live-Work/Loft Houses

A row of live-work houses are shown on the west side of the proposed parking structure at the Florin station. They should include balcony space and roof gardens on top of the parking structure providing a 'green roof' with perforated pavements and recycled water. Live-work units to appeal to young families who work, and who may market what they produce directly from the units. Proximity to the RT station is a double advantage for their occupants. Their presence also reinforces the urban character of the environment in the immediate vicinity of the transit station. The lofts are also an effective part of the effort to screen the parking structure and make it a part of the otherwise pedestrian oriented environment. They are two story units, of varying sizes. Balconies and roof gardens will make

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them very desirable properties, especially for young families. The live-work environment that has been growing in other parts of Sacramento.

- Live-work accommodations are popular in urban areas where young families want to both live and work; possibly creating items that can be sold in the immediate vicinity of the house.
- These units typically occupy two or three levels. Interiors are linked together by open stairs, and often, they are marketed with few partitions and closets. These features reduce the cost of construction, and make it possible for the buyer to finish the units as it suits them.
- The recommended use of these units along the edge of the RT garage, with small open spaces on top of the parking structure, reflects an interest in taking advantage of the RT station, and providing units that are immediately accessible to support transit patronage.
- These units also reduce the visual impact of the parking structure.

Duplexes

West of Indian lane the plan includes duplex style houses, two story attached units with covered parking. These are the largest units in the project plan, at almost 1,400 square feet, and will certainly meet a market for single family houses but at substantially higher net densities of about 15 units to the acre.

- Duplexes are basically small two-story houses that are paired. There may be two garages between the units, with the second story extended above them, or the may share a surface parking between or behind the units.
- Duplexes most nearly represent the density and feel of small lot single family houses and have been included in the mix to accommodate a market for land that is not part of the RT site.

The types of dwelling units included in the program, from townhouses to apartments or condominiums and lofts, are directly related to achieving an urban and walkable environment. Relative to the neighborhoods around it, the Florin station area neighborhood will give more families immediate and comfortable pedestrian access to transit, improving ridership, contributing to a reduction in greenhouse gas generation. The neighborhood is not, however, at the densities that were recommended in the TLC plan, and are often prescribed for TOD. There is substantial park space, plenty of pedestrian circulation including a park like greenway, and a civic plaza that links the southeast corner (near the point of access from the Luther Burbank High School, to the RT station.

As indicated in the Development Program table, the gross density (using the total size of the development area) of residential development for the Base program (the program that comes closest to meeting the requirements established during meetings with the community and elected officials is about 16 du per gross acre. With the maximum program, which reaches closer to RT's goals for TOD and increased ridership, the gross density rises to about 19 dwelling units per acre. On a net basis, reducing the acreage by 20% to account for circulation and open space, the densities rise to 19 units for the Base program, and 23 units for the Max program, per net acre.

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Parenthetically, if the number of acres included in the calculation is confined to the residential development zones, the densities proposed range from 28-33 dwelling units per net acre, which is much closer to a desirable TOD range. Since the entire area is within walking distance of the station, the parks and greenways notwithstanding, there is enough new residential activity to significantly increase transit ridership. A well structured plan for TOD makes as much an issue of walkability as density.

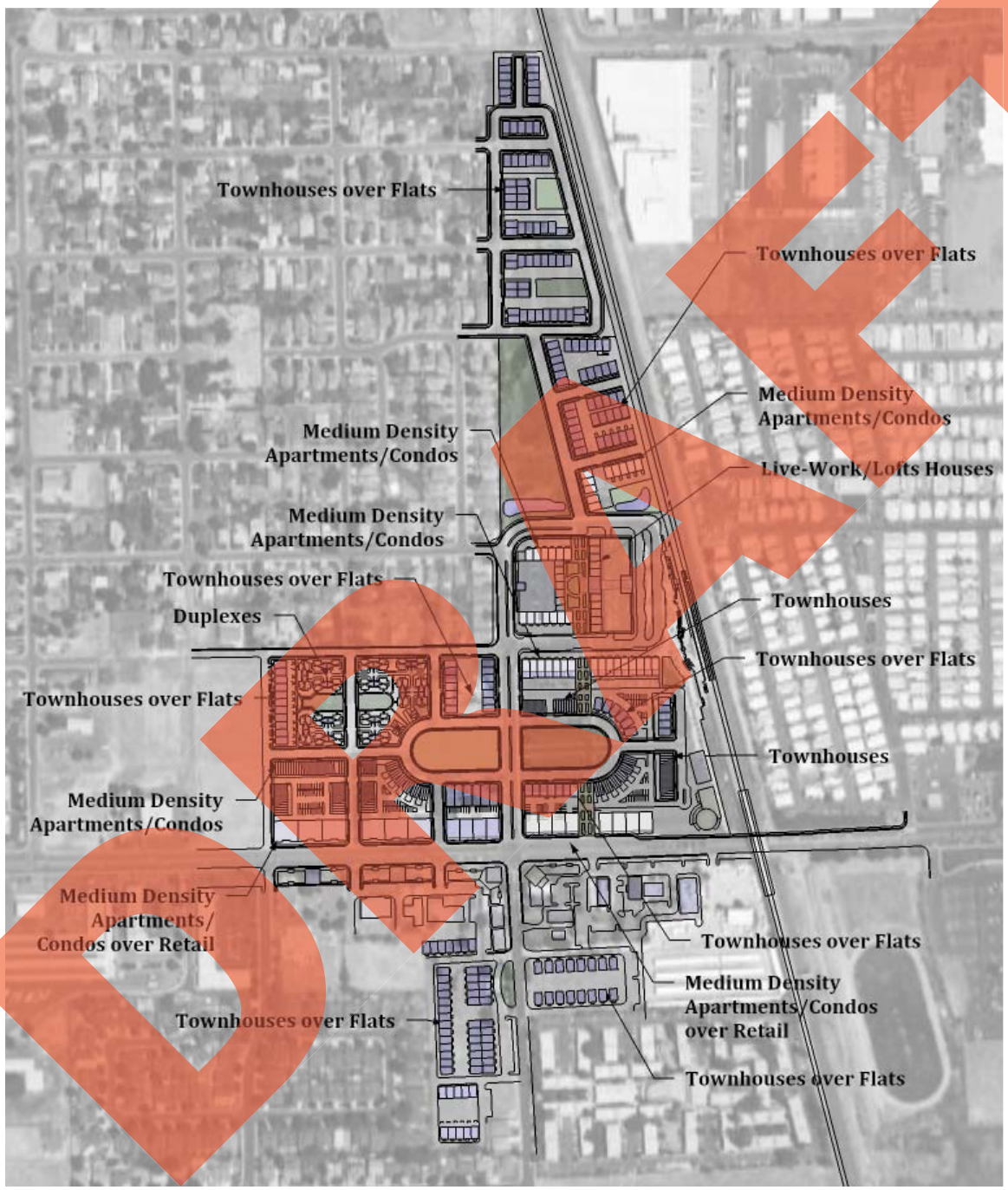

Figure 35 Dwelling Types

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COMMERCIAL COMPONENTS

This is a mixed use plan and is responsive to general guidelines for Transit Oriented Development, while reflecting the earlier TLC plan. While the market for retail and commercial development at this location is not yet well-defined, it is clear that there is presently demand and potential for neighborhood- serving retail. A new neighborhood will further encourage and support neighborhood retail and community serving office space. The building prototypes permit and encourage ground floor retail and, along Florin Road, it is possible that second floor space can be built over retail that will accommodate the service sector. It will ultimately be the market and the developers who determine how much commercial activity is logical. The quality of the Florin neighborhood, and its proximity to the transit station—its high accessibility—may even inspire a more intensive commercial development with a small food service center adjacent to the transit station for example, or a high end restaurant and some shops at the intersection of Florin Road and Indian Lane. One of the architectural prototypes suggests the latter potential.

Neighborhood Serving Mixed-Use Commercial

On both sides of Indian Lane, and on the north of Florin Road, the TOD could accommodate as much as 250,000 square feet of mixed use commercial space. The market will determine how much commercial space is warranted at the Florin Road Station, and specifically, what it might be. The mix could include retail and commercial services, as well as restaurants on the lower level, and professional offices, job training services, and other types of neighborhood and community serving uses above. The option illustrated below is residential over the ground level, which produces the urban opportunity to 'live over the store.' The Florin Road Station is, primarily, a prime location for a pedestrian oriented residential community.

The Corner of Florin Road and Indian Lane This is the 100% corner for retail activity. It is an opportunity for an architectural 'gateway' feature for the TOD Plan. The retail frontage along Florin Road and branching streets within the TOD area should be designed to encourage a 'Main Street' experience

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LAND USE SUMMARY

The following table illustrates what the TOD land-use mix might be in the Florin Road Station area. It includes some of the mixed use residential prototypes that are introduced herein. It follows the framework of development in the preceding sections of this document. In this illustrative table, the net density varies, according to whether the program and the market ultimately dictate a 'base level' of development (DU Base) or a higher, 'max' level (DU Max). The gross densities are not much higher than those that prevail in the existing community, partly because of the generous neighborhood parks and wide streets, as well as the transit station and its parking. On the other hand, the net density is somewhat higher than is typical in the area, which is an important and positive attribute for pedestrian access to transit.

The density is variable, but the number of families will probably range from 900 to 1100, as shown, and over 2,000 people will live here and enjoy the range of features that are in the plan and should be integral in the development.

The program mixes town houses and apartments/condos and includes some live work dwellings so that it can serve a diverse neighborhood population. The neighborhood will grow over time. It will be phased as indicated in the next section of this document, but the interplay between the market and the demand for certain residential prototypes may make subsequent phases quite different from what is forecast here. That will add to the diversity and character of the Florin Road TOD neighborhood.

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LAND USE TABLE

FLORIN STATION PROGRAM									
ZONE	Acres	Residential Uses			Non Residential Uses		Open Space Acreage		
		Building Type	Base	Max	Land Use	SqFt	Factor	Demand	Provided
A	5.0	Townhouses	30	30			0.0075	0.23	
		Townhouses over Flats	6	6			0.0075	0.05	
		Flats	6	6			0.0056	0.03	
		Medium Density Apts/Condos	90	126			0.0044	0.40	
		Apts/Condos over Retail	36	54			0.0044	0.16	
					Retail	5,250			
B	5.7	Townhouses over Flats	26	26			0.0075	0.20	
		Flats	26	26			0.0056	0.15	
		Duplexes	28	28			0.0075	0.21	
					Parks	11,500			0.26
C	1.4				Parks	41,000			0.94
D	1.4				Parks	41,000			0.94
E	3.0	Townhouses	12	12			0.0075	0.09	
		Townhouses over Flats	7	7			0.0075	0.05	
		Flats	7	7			0.0056	0.04	
		Apts/Condos over Retail	40	60			0.0044	0.18	
					Retail	7,500			
F	3.4	Townhouses	6	6			0.0075	0.05	
		Townhouses over Flats	12	12			0.0075	0.09	
		Flats	12	12			0.0056	0.07	
		Medium Density Res	80	112			0.0044	0.35	
					Greenways	8,800			0.20
G	0.9				Civic Center	10,000			
H	1.6				Plaza	45,000			1.03
I	4.7	Medium Density Res	70	98			0.0044	0.31	
		Live/Work Loft Houses	32	32			0.0056	0.18	
					Greenway	15,000			0.34
					Retail	20,500			
J	2.8				Parks	87,000			2.00
K	3.9	Townhouses over Flats	38	38			0.0075	0.29	
		Flats	38	38			0.0056	0.21	
		Medium Density Res	50	70			0.0044	0.22	
					Parks	10,500			0.24
L	6.1	Townhouses over Flats	57	57			0.0075	0.43	
		Flats	57	57			0.0056	0.32	
					Parks	17,500			0.40
M	3.7				Commercial	Redevelopment			
N	7.8				Commercial	Redevelopment			
O	1.8	Townhouses over Flats	16	16			0.0075	0.12	
		Flats	16	16			0.0056	0.09	
P	4.3	Townhouses over Flats	45	45			0.0075	0.34	
		Flats	45	45			0.0056	0.25	
		Medium Density Res	30	30			0.0044	0.13	
					Parks	5,500			0.13
Total	**57.5**		**918**	**1072**				**5.20**	**6.49**
Gross DU/Acre			**16.0**	**18.6**					

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Figure 36 Key Map

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PHASING

Identifying an appropriate Phase One is important in any market driven environment, especially one that also depends upon the continuous operation of an existing light rail station. The principles that guide recommended phasing strategies for the Florin Station area are set forth in the Summary. (These phasing recommendations are made without reference to any on-going negotiations between RT and qualified developers.)

The basic *Phase One* concept works around the property owned by RT nearest the transit station and presently devoted to surface parking. Since only about 200 parking spaces are used each day at the Florin Road Station, only a limited land area needs to remain in that use. This number could be reduced even further with the construction of the South Line Phase 2 to Cosumnes River College.

Given that, the basic Phase One concept is to develop a mixed use project on the eight acres of land extending from Florin Road, north to the mid-point of the existing transit station. These are zones D, F, G, and H, in the Program presented on pages 42 and 43.

The south half of the property will be relatively high density town houses, flats and apartments/condos, with some retail on the ground floor of the Florin Road frontage. The north half, closest to the station, will be relatively high density residential mixed use, with over 200 new dwelling units in apartments/condos and loft housing. The infrastructure for water, sewer and drainage detention should be sized to accommodate future development.

The site of the proposed Community Center is included in Phase One, and it can be built either at the same time as the rest of the development or more likely, deferred to a time when its program and funding are established. Until that time, the land it will occupy can be a paved or partially paved pedestrian plaza.

Phase One permits bus and automobile traffic bound for the transit station to continue to use Indian Lane, and it reserves over two acres for surface parking which is sufficient to serve the continuing demand for park and ride at the Florin Road Station. Existing detention basins are also retained to simplify the early phase of development.

Future phases of development can occur around the transit station site at any time as long as they do not require alteration of transit operations and parking.

Development on the vacant residential land west of Indian Lane (A, B, and C), for example, can occur as soon as the market deems it feasible; as can any of the proposed development to the south of Florin Road. Development of the northern zones, J, K, and L can also occur as the market dictates the demand.

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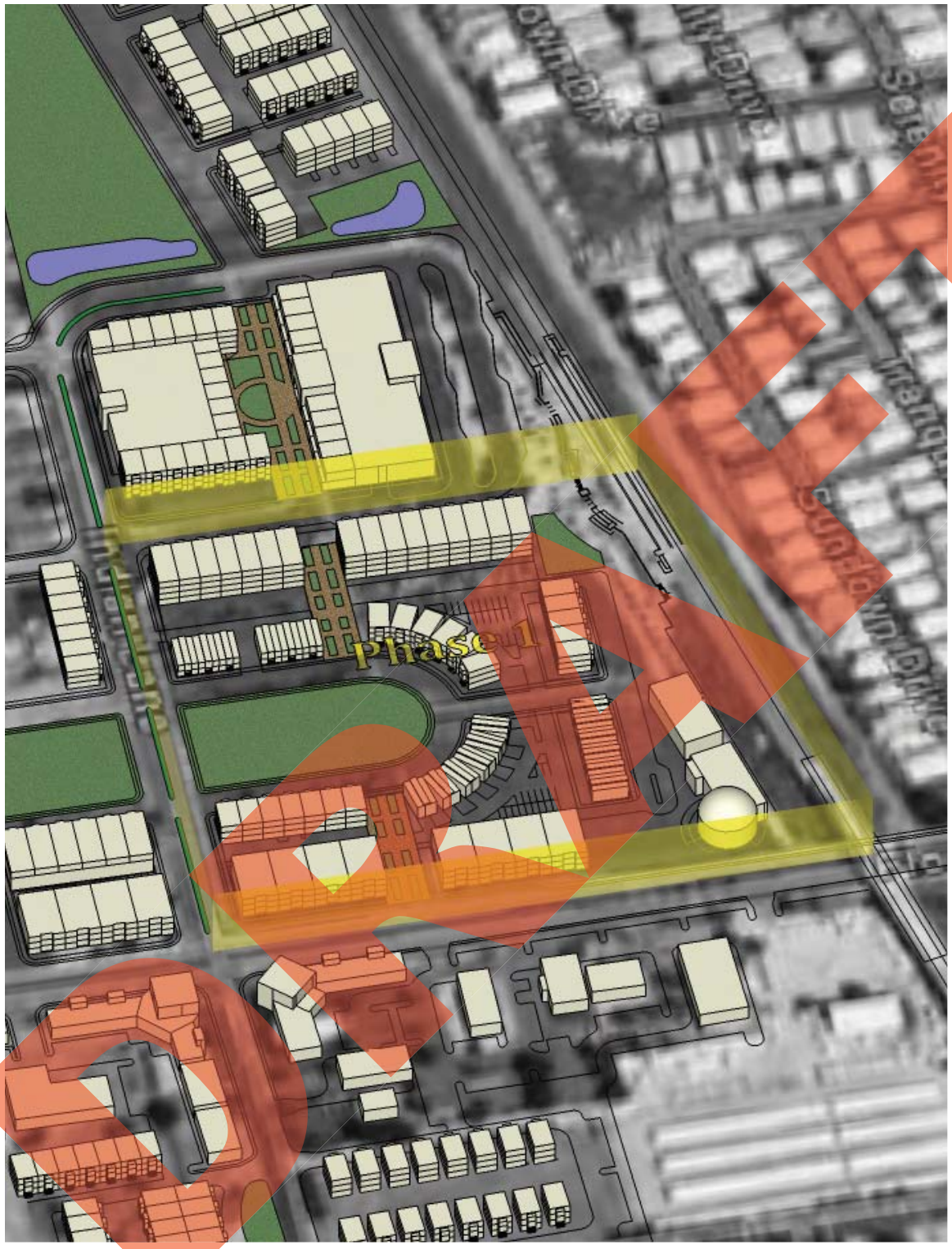

Figure 37 Conceptual Phase 1

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PLAN OPTIONS

The basic concept presented in this document for the 55 acres of developable land at the Florin Road Station represents the efforts of a multi-disciplined technical team; that effort has been shaped by an extensive dialogue with the community, city staff, and with decision-makers. As with any planning exercise, there are options to the proposed/recommended concept presented herein. Potentially, these options could also enhance residential communities in the area while meeting emerging markets for a mixed use community. As the community evolves and the market changes, potential alternatives may arise – but the concept presented herein reflects the "best efforts" of balancing all of the various stakeholders and visions communicated by the participants in the planning process.

Developing an overall coherence for the proposed/recommended concept has been the goal. The quality of the pedestrian oriented residential community is equally important and has also been a key driver in the development of this concept. The proposed/recommended character of this concept and plan has been designed with a balance of parks, traffic and parking, and infrastructure (needed improvements in water, sewer, and drainage systems) requirements. As presented in this report, the densities and scale of development of the plan have also been tailored to meet the stated interests of the community and elected officials, as well as the marketplace. Conceivably, any or all of these could change over time as the community and the region evolves.

TOD Densities

During the course of this effort, alternative concepts have been raised, discussed and studied. And there are benefits. RT is the majority owner of property, and this is a Transit-Oriented Development. A higher intensity development (than proposed) would promote more transit patronage.

Park and Ride Parking Location

The location of park and ride parking adjacent to the existing transit station is a logical feature of this plan. But transit parking need not be next to the station. If there were only residential contiguous to the station, and the park and ride facility was located along the frontage road (recognizing that there are upper limits to the walk distance most transit users will tolerate) transit patronage might be increased.

Parks and Open Space

Parks and open space size and placement have also received considerable attention and have been the subject of some debate. Much of the required open space is now provided in 'Small Public Spaces' as noted in the plan. However, the parks as proposed still represent a compromise with the goal of high density development as close to the transit station as possible. The current plan makes parks a defining element of the proposed new neighborhood; but at the same time, it crafts the parks as a major element for easy and safe pedestrian circulation to transit, using open space as a conduit for pedestrian traffic.

Mixed Use Development

The transit equation favors the inclusion of retail to line the path from home, or a parking facility to the transit station. Yet, mixed-use commercial facilities near transit stations may reduce residential density in close proximity to the station. Of course it is acknowledged that higher density residential in major transit oriented centers across the nation often include ground floor retail. This plan does not preclude mixed use, and it acknowledges that more

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housing near the transit station can be included if the market and the developer are committed to that alternative.

RT Parking Location and Development Alternatives

Regional Transit will have significant control over the ultimate development, because it owns 22 of the 56 acres in the TOD area. The ultimate development of the Florin Road properties will be responsive to the largest property owner's requirements, but will also balance the residential preferences of the community and traffic, infrastructure and open space in the new neighborhood.

There are two basic alternatives that could be implemented to increase intensity of development in the area around the transit station.

- As illustrated below, the development over the transit parking could be substantially increased in density recognizing that the site is the best place to add units and parking, with the least negative impact on the surrounding neighborhoods.

Alternative Development at the RT Station

Rather than increasing density at the station, the RT garage could be shifted to the Florin Road frontage where the impact of park and ride vehicles through the new neighborhood would be reduced. The development at the station would then start at grade with a retail or community-related use (e.g., athletic club). The upper levels would consist of parking and residential and could achieve relatively higher density overall.

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WATER, SANITARY SEWER, DRAINAGE AND FLOOD PLAIN

This TOD plan was scoped so that plans for traffic, water, sewers, drainage, and other utilities would be developed in parallel with the plans for TOD development at the two sites. The capacity of the infrastructure, to what extent it can be enlarged to accommodate growth, is a controlling factor. The cost of infrastructure is an important measure of the feasibility of future development. The *Infrastructure Report* which accompanies these guidelines contains an order of magnitude cost estimate for each of the infrastructure systems, assuming that they will be improved and enlarged to serve new development on the Florin development area.

Water

- The existing system provides ample flow to serve the new development, but the system will not have sufficient pressure to serve relatively high density commercial and residential development.
- The developers of these uses will provide fire booster pumps to attain the needed fire suppression pressure. This is not an unusual or prohibitive requirement.
- The Florin Road Station will require a water tank, lift station or some other mechanism approved by the City at the time of development to comply with the City of Sacramento's required pressure and flow standards.

Sanitary Sewer

The station is at the upstream end of the large sanitary sewer system that serves this area. Because of this, invert depths are relatively shallow, so the sanitary sewer plan proposes a series of new gravity mains on development sites that will then be fed into a lift station and thence, through a force main at 24th Street. The capacity of this force main constrains, to some extent, the level of development that can be achieved, but current plan levels are feasible. Other options, including the development of very large storage tanks near the sites, have been considered, but their cost and the potential need for odor control makes them less feasible.

Other features of the proposed sanitary sewer system:

1. Gravity mains for the buildings nearest the existing mains with available capacity connected to those existing mains
2. Gravity mains for the remainder of the buildings that will flow to the center of the station development zone

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Drainage

- The drainage facilities presented in the TOD concepts and Guidelines are preliminary. At the time of development, a more-detailed drainage study will be required to determine more precisely the location and size of the detention basins, the size of the pipe conveyance system and the terminal point of discharge.
- The conceptual storm drainage system is comprised of a network of inlets, manholes, storm drain pipes and detention basins that are sufficient to contain and convey the 10 year - 6 hour storm event without surface flooding and will prevent structure damage for a 100-year storm event.
- The design for the Florin area includes 1.5 million square feet of detention storage. The detention storage can be above ground detention ponds in the early stages of development, replaced by below-grade vault storage or below grade pipe arrays in later phases.
- The grading plan for the site will provide sufficient surface storage for the 100 year event without increasing peak surface discharge from the site.
- Top of slab and finish floor elevations of new buildings must be above the 100-year flood elevations.

In addition, and in keeping with contemporary water quality and water conservation practices, the plan will include:

- Vegetated swales in parks, streets, and parking lots
- Sand filters to clear runoff prior to entering storage/recycling basins, pipes or vaults
- Pervious pavements to decrease runoff and reduce contaminant levels
- Storm vaults will be the equivalent of the Jensen Precast Concrete vault

Flood Plain

At this time, according to the latest Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), Letter of Map Revision (LOMR) dated February 21, 2007 the site is located in an area designated as a shaded Zone X. FEMA describes the shaded Zone X as: areas of 500-year flood: areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood. In regards to the floodplain, there are no elevation requirements for building in this zone. Flood insurance is recommended but not mandatory.

The area that lies to the east of the railroad tracks is currently in area designated as a Zone A99. FEMA describes Zone A99 as a Special Flood Hazard Area that could be inundated by a 100-year flood. To be protected from 100-year floods, a flood protection system is under construction. In regards to this floodplain, there are no elevation requirements for building in this zone, however, flood insurance is mandatory.

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The following site design guidelines are necessary to achieve the intent of the TOD urban design concept.

These guidelines are intended to convey the intent of the plan, which is the product of community, staff, and elected representation of the Florin Road Station area. There is an emphasis on pedestrian friendly, highly accessible streets and neighborhoods. There is an emphasis on visual amenity, as well as on safe and open vistas, so that pedestrians, especially children and seniors, feel safe due to their visibility from many angles and 'eyes on the street.' The guidelines should be used to evaluate the proposals received from the development community for this location.

A. Site Design

Ai. Development should feature pedestrian friendly blocks and streets

Ai-1 Public spaces will be visible and accessible

Ai-2 Buildings or entry courts will extend to the property line

Ai-3 Where parking is located behind buildings, it will be screened from the sidewalk.

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Ai-4 Parking access (curb cuts) will be provided to interior lots, not to individual houses, and limited in number and size.

Ai-5 The street level of mixed use buildings with commercial on the ground floor will include a large percentage of window area to ensure that the sidewalk can be seen from inside and interior lighting illuminates the sidewalk at night.

Ai-6 Trees along sidewalks and paseos will be spaced no more than 35 feet on center and will have broad canopies to provide shade.

Aii. The Development will Feature Green and Sustainable Neighborhoods

Aii-1 Open spaces shall meet Park and Recreation standards and provide diverse passive and active recreation opportunities for all age groups.

Aii-2 The TOD district will be developed to accommodate urban residential development in pedestrian friendly neighborhoods defined by landscaped sidewalks, plazas, playgrounds, and paseos.

Aii-3 There is an opportunity to reuse stormwater effluent in the parks and on the landscape areas that are a feature of the plan for this TOD. The plan for surface drainage will incorporate recycling and re-using run-off. The site drainage recommendations also include provisions for fenced and/or open detention basins or below grade reservoirs to slow the flow of surface water into the main system. Larger spaces will be designed for water detention and re-use. As shown in the master plan diagrams, the roofs of large structures like the parking structures at the transit station may be planted to reduce run-off and to permit collection and re-use of rainfall and irrigation water. The development will employ energy conserving design elements and employ alternative energy sources where feasible. Following current LEEDs practice, the developer(s) of the station area will include solar panels to supplement energy from the network.

Aii-4 The architecture of residential and mixed use buildings will incorporate design measures (many of which are already included in these guidelines) to reduce heat gain

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and reduce the need for mechanical air conditioning. These include inset windows, balconies, overhangs and canopies, and green roofs, where applicable.

Aii-5 Buildings will be light colored to reduce solar heat gain. Buildings will be sited and designed to minimize east and west exposure. Large buildings such as apartment blocks and parking structures will have green roofs that shield the spaces below, provide accessible passive recreation space, and retain and recycle rain water.

Aii-6 On-site parking will be covered or planted with trees to provide an (ultimate) 75% canopy cover and screened to minimize heat absorption and radiation. Building facades immediately adjacent to the RT tracks shall have porches, exterior louvers, and double glazed windows to mitigate the visual and acoustical impact of passing transit and freight trains. Specified building materials and fabrication methods will contribute to energy conservation during manufacture, installation and after. Type 5 construction employing recycled materials and prefabricated panels are an example.

Aiii. The circulation network serves pedestrians and bicycles first and foremost.

The neighborhood will consist of blocks of mixed use development defined by streets and sidewalks designed for pedestrians and bicycles first, and then, for cars. The block pattern will follow the concepts illustrated in the TOD plan. The perimeter of neighborhood blocks may not exceed 1,600 feet with smaller blocks for townhouses, and situations where parking is in structures.

Aiv. Street design standards that accommodate pedestrians and bicycles first

Confine vehicular access to the transit station to a limited number of streets. In general only two travel lanes are required on all streets, except where shown and as needed to accommodate RT buses and shuttles serving the transit station.

Aiv-1 Parking at the curb shall be provided wherever possible.

Av. Traffic calming is essential in a TOD environment

Traffic calming is built into the street design standards for the TOD site. Since the principal objective of the TOD plan is to encourage pedestrian/transit interface, it is essential to use such devices as raised crosswalks, special pavements for pedestrian crossing, pedestrian refuge islands, and extended curbs to ensure the safety and the perceived priority of pedestrian movement.

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Avi. Pedestrian sidewalks should be visually, physically, and acoustically buffered from vehicular movement and noise.

The development guidelines recommend that curbside parking should be required on neighborhood streets and others where the right of way permits. Parked cars at the curb screen the pedestrian environment from moving traffic.

Avi-1 The sidewalk should be separated from the street by a continuous planter bed in which small shade trees will be planted no more than 35 feet on center. They will provide a real barrier and a visual screen between cars and pedestrians

Avii. Land uses, densities and intensities should be transit supportive.

Avii-1 The long range development of the transit station area will be relatively high density mixed use development over a parking structure that has ground floor retail or community facility. The whole complex will be designed to facilitate access to the transit station from the TOD neighborhood.

Avii-2 The interface between the transit station and the TOD area will be a well-designed mixed use building that includes parking for transit and for commercial civic or residential uses that are built over, under, and adjacent to the parking.

Aviii. The Transit–Rail Interface (east side of station area) will minimize acoustic and visual hazards that may be associated with transit and rail operations.

Aviii-1 Residential lots along the RT tracks shall face away from the track if possible. Property lines will be set back at least twenty four feet to permit screen planting and/or walls by the developer or RT.

Aviv. Development will carefully blend with the existing neighborhoods

Aviv-1 Where there are backyards, or front yards on a street facing into the TOD site, the plan for new development will either match that orientation or make a specific accommodation to sustain property values. Screen parking areas and alleys from existing neighborhoods. No multi-level parking structures will face existing development

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B. BUILDING DESIGN

Bi. Buildings will be designed to contribute to functions and activities that occur outside of their wall at the interface with the public environment.

Bi-1 Entrances to residential buildings will be set-in or set back

Bi-2 Shop fronts will be largely transparent and visually open

Bi-3 Sidewalk and plaza areas will be integrated into the retail and dining environment

Bi-4 Street level façades on the Florin Road frontage should be arcaded or set back whether retail or residential uses.

Bi-5 A variety of architectural means should be employed for privacy, security and identity.

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Bi-6 The street and the retail environments should be complementary.

Bi-7 Facades above the street level should be double glazed and articulated to reduce acoustic and visual 'noise' from the street.

Bi-8 If the market exists for neighborhood serving office space, they may occupy street level and upper levels of buildings facing on Florin Road.

Bi-9 Access to parking is prohibited from Florin Road.

Bi-10 Free-standing signs are prohibited, but projecting signs and signs on facades are encouraged.

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C. TREES RECOMMENDED

The following recommendations are adapted from the City of Sacramento Parking Lot Tree Shading Design and Maintenance Guidelines

Ci. Trees planted in parking areas, along sidewalks and on the perimeter of development areas will be compatible with eight-foot (8'-0") planter widths. Tree canopies will vary from relatively small (20 to 25 foot canopies) to large canopy shade trees. The trees will be spaced no more than 35 feet on center. These 'row trees' may be varied in patterns, or paired, or grouped, as long as the patterns relate to the often linear rights of way they shade.

C.ii Trees planted along sidewalks will be in eight-feet by sixteen-feet (8' x 16') planters, with parking bays or pedestrian and transit bulbouts between planters. On streets with driveway access to parking, the tree planters will be sized and spaced to accommodate the access points.

Cii-1 The allowable species are as follows (drought tolerant trees are favored):

- California Bay (drought tolerant)
- Chaste Tree (drought tolerant)
- Crape Myrtle
- Dutch Elm (resistant to Dutch Elm disease)
- Eastern Redbud (moderate irrigation)
- Green Vase Zelkova
- Japanese Maple
- Oak

C.iii Trees planted in public open spaces, in parks, mini parks and along the rail right of way will have relatively large canopies (30 to 35 foot canopies to provide a forest like canopy) and maximum shade. The trees will be clustered to provide shaded groves, and to define public gathering spaces. The planting patterns will feature diversity of species, foliage and flowers.

C.iii-1 The allowable species are as follows (all are drought tolerant)

- Coast Live Oak
- Holly Oak
- Cork Oak
- Eucalyptus microtheca coolbah
- Jelecote Pine
- Chinese Pistache
- Shumard Red Oak
- Green Vase Zelkova

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ZONING

On the following page, a Zoning Table is presented. This table provides a comparison of the general categories of land use that are recommended in this Concept and Guidance document with the city of Sacramento's current zoning code.

As the General Plan is being revised, there maybe some modifications to the existing city of Sacramento zoning ordinance, based on recent preliminary studies and preliminary conclusions from the General Plan update effort. As an example, the DRAFT Land Use & Urban Form Workbook (June 5, 2007) explains the methodology being used:

With the increasing interest in urban form and implementing Smart Growth principles, the new General Plan will include a diagram and set of designations that combine direction for both land use and urban form. The system includes components that address legal requirement for allowed uses and population density and building intensity as well as urban form criteria for the different neighborhoods and centers throughout the city. These components work together to define allowed uses and building intensities as well as the overall role of each area of the city, whether it is for living (neighborhoods), gathering and employment (centers), travel and commerce (corridors), preservation (open space) or a unique role (other district) such as a college.

In that same spirit, this set of recommended zoning guidelines aims to create a high quality mixed-use neighborhood that is responsive to the various environmental factors that surround it, and add to the neighborhood's long-term viability.

The description of 'Urban Corridor Low' in the Land Use & Urban Form Workbook relates closely to the characteristics of a TOD area and that which is proposed herein. For the 'Urban Corridor Low', the FAR is between 0.5 and 3.0, and residential densities range from 20 to 60 units per net acre, which is somewhat higher than the ceiling adopted in this set of recommendations. Conceivably, there could be designated districts within this Station Area concept, such as the area closest to the RT station, which could achieve those densities in the future.

Other recommendations in the Land Use and Urban Form Workbook accord very well with the recommendations for TOD areas that are incorporated herein.

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FLORIN STATION PROGRAM			
Key Map	Recommended Land Uses	Recommended Zoning	Adopted Development Standards for Recommended Zoning
A	• Townhouses • Townhouses over Flats • Medium Density Apartments/Condos • Medium Density Apartments/Condos over Retail • Retail (5,250 ft^2) Density ≈ 42-56 du/na (80% gross:net)	RMX-TO *Portion outside of the ¼ mile should be RMX*	• This zone permits multiple family residential, office and limited commercial uses in a mixture established for the area through a special planning district or adopted locational standards. • Buildings shall not exceed fifty-five (55) feet in height; however, the planning director may permit additional height up to seventy-five (75) feet in mixed use buildings with at least twenty-five (25) percent of the gross building square footage devoted to residential use, or buildings that include structured parking and open space. Any portion of a building within one hundred (100) feet of a parcel zoned or used for single-family use shall not exceed thirty-five (35) feet in height. • Net FAR of 0.4 to 3.0. • Net residential densities of 15 du/na to 60 du/na. • Nonresidential uses may occupy a maximum of fifty (50) percent of the gross square footage. • Parking for retail uses shall be provided at not more than one space per two hundred fifty (250) gross square feet. • Parking for residential uses shall be provided at a ratio of one parking space per unit plus one guest parking space per fifteen (15) parking spaces provided. Parking for non-residential uses shall be provided at not less than one space per five hundred (500) gross square feet and not more than one space per three hundred seventy-five (375) gross square feet. • The minimum front yard setback shall be zero feet. The minimum street side yard setback shall be zero feet. The minimum rear yard setback shall be fifteen (15) feet. The minimum interior side yard setback shall be five feet. Any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the front yard property line; and any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the street side yard property line.
B	• Townhouses over Flats • Duplexes • Parks Density ≈ 20 du/na (70% gross:net)	RMX-TO *Portion outside of the ¼ mile should be RMX*	• This zone permits multiple family residential, office and limited commercial uses in a mixture established for the area through a special planning district or adopted locational standards. • Buildings shall not exceed fifty-five (55) feet in height; however, the planning director may permit additional height up to seventy-five (75) feet in mixed use buildings with at least twenty-five (25) percent of the gross building square footage devoted to residential use, or buildings that include structured parking and open space. Any portion of a building within one hundred (100) feet of a parcel zoned or used for single-family use shall not exceed thirty-five (35) feet in height. • Net FAR of 0.4 to 3.0. • Net residential densities of 15 du/na to 60 du/na. • Nonresidential uses may occupy a maximum of fifty (50) percent of the gross square footage. • Parking for retail uses shall be provided at not more than one space per two hundred fifty (250) gross square feet. • Parking for residential uses shall be provided at a ratio of one parking space per unit plus one guest parking space per fifteen (15) parking spaces provided. Parking for non-residential uses shall be provided at not less than one space per five hundred (500) gross square feet and not more than one space per three hundred seventy-five (375) gross square feet. • The minimum front yard setback shall be zero feet. The minimum street side yard setback shall be zero feet. The minimum rear yard setback shall be fifteen (15) feet. The minimum interior side yard setback shall be five feet. Any portion of each building that is

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			twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the front yard property line; and any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the street side yard property line.
C	• Parks	AOS	This is an exclusive agricultural zone designed for the long term preservation of agricultural and open space land. This zone is designated to prevent the premature development of land in this category to urban uses.
D	• Park	AOS	This is an exclusive agricultural zone designed for the long term preservation of agricultural and open space land. This zone is designated to prevent the premature development of land in this category to urban uses.
E	• Townhouses • Townhouses over Flats • Medium Density Apartments/Condos • Medium Density Apartments/Condos over Retail • Retail (7,500 ft^2) Density ≈ 29-38 du/na (75% gross:net)	C-2-TO	• This is a general commercial zone which provides for the sale of commodities, or performance of services, including repair facilities, offices, small wholesale stores or distributors, and limited processing and packaging. • Buildings in the TO zone shall not exceed fifty-five (55) feet in height; however, the planning director may permit additional height up to seventy-five (75) feet in mixed use buildings with at least twenty-five (25) percent of the gross building square footage devoted to residential use, or buildings that include structured parking and open space. Any portion of a building within one hundred (100) feet of a parcel zoned or used for single-family use shall not exceed thirty-five (35) feet in height. • Net FAR of 0.4 to 3.0. • Net residential densities of 15 du/na to 60 du/na. • Parking for retail uses shall be provided at not more than one space per two hundred fifty (250) gross square feet. • Parking for residential uses shall be provided at a ratio of one parking space per unit plus one guest parking space per fifteen (15) parking spaces provided. Parking for non-residential uses shall be provided at not less than one space per five hundred (500) gross square feet and not more than one space per three hundred seventy-five (375) gross square feet. • The minimum front yard setback shall be zero feet. The minimum street side yard setback shall be zero feet. The minimum rear yard setback shall be fifteen (15) feet. The minimum interior side yard setback shall be five feet. Any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the front yard property line; and any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the street side yard property line.
F	• Townhouses • Townhouses over Flats • Medium Density Apartments/Condos • Greenway Density ≈ 43-56 du/na (75% gross:net)	RMX-TO	• This zone permits multiple family residential, office and limited commercial uses in a mixture established for the area through a special planning district or adopted locational standards. • Buildings shall not exceed fifty-five (55) feet in height; however, the planning director may permit additional height up to seventy-five (75) feet in mixed use buildings with at least twenty-five (25) percent of the gross building square footage devoted to residential use, or buildings that include structured parking and open space. Any portion of a building within one hundred (100) feet of a parcel zoned or used for single-family use shall not exceed thirty-five (35) feet in height. • Net FAR of 0.4 to 3.0. • Net residential densities of 15 du/na to 60 du/na. • Nonresidential uses may occupy a maximum of fifty (50) percent of the gross square footage. • Parking for retail uses shall be provided at not more than one space per two hundred fifty (250) gross square feet. • Parking for residential uses shall be provided at a ratio of one

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			parking space per unit plus one guest parking space per fifteen (15) parking spaces provided. Parking for non-residential uses shall be provided at not less than one space per five hundred (500) gross square feet and not more than one space per three hundred seventy-five (375) gross square feet. • The minimum front yard setback shall be zero feet. The minimum street side yard setback shall be zero feet. The minimum rear yard setback shall be fifteen (15) feet. The minimum interior side yard setback shall be five feet. Any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the front yard property line; and any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the street side yard property line.
G	• Community Serving Civic Uses (day care, senior care, library, etc.) • Greenway	C-2-TO	• This is a general commercial zone which provides for the sale of commodities, or performance of services, including repair facilities, offices, small wholesale stores or distributors, and limited processing and packaging. • Buildings in the TO zone shall not exceed fifty-five (55) feet in height; however, the planning director may permit additional height up to seventy-five (75) feet in mixed use buildings with at least twenty-five (25) percent of the gross building square footage devoted to residential use, or buildings that include structured parking and open space. Any portion of a building within one hundred (100) feet of a parcel zoned or used for single-family use shall not exceed thirty-five (35) feet in height. • Net FAR of 0.4 to 3.0. • Net residential densities of 15 du/na to 60 du/na. • Parking for retail uses shall be provided at not more than one space per two hundred fifty (250) gross square feet. • Parking for residential uses shall be provided at a ratio of one parking space per unit plus one guest parking space per fifteen (15) parking spaces provided. Parking for non-residential uses shall be provided at not less than one space per five hundred (500) gross square feet and not more than one space per three hundred seventy-five (375) gross square feet. • The minimum front yard setback shall be zero feet. The minimum street side yard setback shall be zero feet. The minimum rear yard setback shall be fifteen (15) feet. The minimum interior side yard setback shall be five feet. Any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the front yard property line; and any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the street side yard property line.
H	• Plaza	AOS	This is an exclusive agricultural zone designed for the long term preservation of agricultural and open space land. This zone is designated to prevent the premature development of land in this category to urban uses.
I	• Medium Density Apartments/Condos • Live-Work/Loft Houses • Parking Garage with retail • Retail (20,500 ft^2) • Greenway Density ≈ 43-55 du/na (50% gross:net)	C-2-TO	• This is a general commercial zone which provides for the sale of commodities, or performance of services, including repair facilities, offices, small wholesale stores or distributors, and limited processing and packaging. • Buildings in the TO zone shall not exceed fifty-five (55) feet in height; however, the planning director may permit additional height up to seventy-five (75) feet in mixed use buildings with at least twenty-five (25) percent of the gross building square footage devoted to residential use, or buildings that include structured parking and open space. Any portion of a building within one hundred (100) feet of a parcel zoned or used for single-family use shall not exceed thirty-five (35) feet in height. • Net FAR of 0.4 to 3.0. • Net residential densities of 15 du/na to 60 du/na.

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			• Parking for retail uses shall be provided at not more than one space per two hundred fifty (250) gross square feet. • Parking for residential uses shall be provided at a ratio of one parking space per unit plus one guest parking space per fifteen (15) parking spaces provided. Parking for non-residential uses shall be provided at not less than one space per five hundred (500) gross square feet and not more than one space per three hundred seventy-five (375) gross square feet. • The minimum front yard setback shall be zero feet. The minimum street side yard setback shall be zero feet. The minimum rear yard setback shall be fifteen (15) feet. The minimum interior side yard setback shall be five feet. Any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the front yard property line; and any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the street side yard property line.
J	• Park	AOS	This is an exclusive agricultural zone designed for the long term preservation of agricultural and open space land. This zone is designated to prevent the premature development of land in this category to urban uses.
K	• Townhouses over Flats • Medium Density Apartments/Condos • Park Density ≈ 43-50 du/na (75% gross:net)	RMX-TO	• This zone permits multiple family residential, office and limited commercial uses in a mixture established for the area through a special planning district or adopted locational standards. • Buildings shall not exceed fifty-five (55) feet in height; however, the planning director may permit additional height up to seventy-five (75) feet in mixed use buildings with at least twenty-five (25) percent of the gross building square footage devoted to residential use, or buildings that include structured parking and open space. Any portion of a building within one hundred (100) feet of a parcel zoned or used for single-family use shall not exceed thirty-five (35) feet in height. • Net FAR of 0.4 to 3.0. • Net residential densities of 15 du/na to 60 du/na. • Nonresidential uses may occupy a maximum of fifty (50) percent of the gross square footage. • Parking for retail uses shall be provided at not more than one space per two hundred fifty (250) gross square feet. • Parking for residential uses shall be provided at a ratio of one parking space per unit plus one guest parking space per fifteen (15) parking spaces provided. Parking for non-residential uses shall be provided at not less than one space per five hundred (500) gross square feet and not more than one space per three hundred seventy-five (375) gross square feet. • The minimum front yard setback shall be zero feet. The minimum street side yard setback shall be zero feet. The minimum rear yard setback shall be fifteen (15) feet. The minimum interior side yard setback shall be five feet. Any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the front yard property line; and any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the street side yard property line.
L	• Townhouses over Flats • Parks Density ≈ 27 du/na (70% gross:net)	RMX	• This zone permits multiple family residential, office and limited commercial uses in a mixture established for the area through a special planning district or adopted locational standards. • Building heights shall not exceed thirty-five (35) feet; however, the planning commission shall have the authority to issue a special permit for a residential or residential mixed-use building up to forty-five (45) feet in height. • Maximum density is thirty-six (36) dwelling units per acre. • For new development on lots greater than three thousand two hundred (3,200) square feet in area, commercial and office uses are limited to the ground floor only and may occupy up to a

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			maximum of fifty (50) percent of the building square footage. • For new development on lots having three thousand two hundred (3,200) square feet or less in area, commercial and office uses are limited to the ground floor only and may occupy up to a maximum of fifty (50) percent of the building square footage; provided, that the percentage of commercial or office use may be increased up to one hundred (100) percent of the building square footage, subject to approval of a zoning administrator's special permit. • Parking for residential uses shall be provided at a ratio of one parking space per unit plus one guest parking space per fifteen (15) parking spaces provided (7 units or fewer do not require a guest space). Non residential parking ratio is dependent upon the specific use. • For new mixed-use projects which incorporate both residential and neighborhood-serving commercial retail or service uses, the zoning administrator may reduce or waive up to fifty (50) percent of the required off-street parking requirement for the ground-floor commercial retail or service uses, subject to a zoning administrator's special permit.
M	• Commercial	C-2-TO	• This is a general commercial zone which provides for the sale of commodities, or performance of services, including repair facilities, offices, small wholesale stores or distributors, and limited processing and packaging. • Buildings in the TO zone shall not exceed fifty-five (55) feet in height; however, the planning director may permit additional height up to seventy-five (75) feet in mixed use buildings with at least twenty-five (25) percent of the gross building square footage devoted to residential use, or buildings that include structured parking and open space. Any portion of a building within one hundred (100) feet of a parcel zoned or used for single-family use shall not exceed thirty-five (35) feet in height. • Net FAR of 0.4 to 3.0. • Net residential densities of 15 du/na to 60 du/na. • Parking for retail uses shall be provided at not more than one space per two hundred fifty (250) gross square feet. • Parking for residential uses shall be provided at a ratio of one parking space per unit plus one guest parking space per fifteen (15) parking spaces provided. Parking for non-residential uses shall be provided at not less than one space per five hundred (500) gross square feet and not more than one space per three hundred seventy-five (375) gross square feet. • The minimum front yard setback shall be zero feet. The minimum street side yard setback shall be zero feet. The minimum rear yard setback shall be fifteen (15) feet. The minimum interior side yard setback shall be five feet. Any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the front yard property line; and any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the street side yard property line.
N	• Commercial	C-2-TO	• This is a general commercial zone which provides for the sale of commodities, or performance of services, including repair facilities, offices, small wholesale stores or distributors, and limited processing and packaging. • Buildings in the TO zone shall not exceed fifty-five (55) feet in height; however, the planning director may permit additional height up to seventy-five (75) feet in mixed use buildings with at least twenty-five (25) percent of the gross building square footage devoted to residential use, or buildings that include structured parking and open space. Any portion of a building within one hundred (100) feet of a parcel zoned or used for single-family use shall not exceed thirty-five (35) feet in height. • Net FAR of 0.4 to 3.0. • Net residential densities of 15 du/na to 60 du/na. • Parking for retail uses shall be provided at not more than one

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			space per two hundred fifty (250) gross square feet. • Parking for residential uses shall be provided at a ratio of one parking space per unit plus one guest parking space per fifteen (15) parking spaces provided. Parking for non-residential uses shall be provided at not less than one space per five hundred (500) gross square feet and not more than one space per three hundred seventy-five (375) gross square feet. • The minimum front yard setback shall be zero feet. The minimum street side yard setback shall be zero feet. The minimum rear yard setback shall be fifteen (15) feet. The minimum interior side yard setback shall be five feet. Any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the front yard property line; and any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the street side yard property line.
O	• Townhouses over Flats Density ≈ 22 du/na (80% gross:net)	RMX-TO	• This zone permits multiple family residential, office and limited commercial uses in a mixture established for the area through a special planning district or adopted locational standards. • Buildings shall not exceed fifty-five (55) feet in height; however, the planning director may permit additional height up to seventy-five (75) feet in mixed use buildings with at least twenty-five (25) percent of the gross building square footage devoted to residential use, or buildings that include structured parking and open space. Any portion of a building within one hundred (100) feet of a parcel zoned or used for single-family use shall not exceed thirty-five (35) feet in height. • Net FAR of 0.4 to 3.0. • Net residential densities of 15 du/na to 60 du/na. • Nonresidential uses may occupy a maximum of fifty (50) percent of the gross square footage. • Parking for retail uses shall be provided at not more than one space per two hundred fifty (250) gross square feet. • Parking for residential uses shall be provided at a ratio of one parking space per unit plus one guest parking space per fifteen (15) parking spaces provided. Parking for non-residential uses shall be provided at not less than one space per five hundred (500) gross square feet and not more than one space per three hundred seventy-five (375) gross square feet. • The minimum front yard setback shall be zero feet. The minimum street side yard setback shall be zero feet. The minimum rear yard setback shall be fifteen (15) feet. The minimum interior side yard setback shall be five feet. Any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the front yard property line; and any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the street side yard property line.
P	• Townhouses over Flats • Medium Density Apartments/Condos Density ≈ 35 du/na (80% gross:net)	RMX	• This zone permits multiple family residential, office and limited commercial uses in a mixture established for the area through a special planning district or adopted locational standards. • Building heights shall not exceed thirty-five (35) feet; however, the planning commission shall have the authority to issue a special permit for a residential or residential mixed-use building up to forty-five (45) feet in height. • Maximum density is thirty-six (36) dwelling units per acre. • For new development on lots greater than three thousand two hundred (3,200) square feet in area, commercial and office uses are limited to the ground floor only and may occupy up to a maximum of fifty (50) percent of the building square footage. • For new development on lots having three thousand two hundred (3,200) square feet or less in area, commercial and office uses are limited to the ground floor only and may occupy up to a maximum of fifty (50) percent of the building square footage; provided, that

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			the percentage of commercial or office use may be increased up to one hundred (100) percent of the building square footage, subject to approval of a zoning administrator's special permit. • Parking for residential uses shall be provided at a ratio of one parking space per unit plus one guest parking space per fifteen (15) parking spaces provided (7 units or fewer do not require a guest space). Non residential parking ratio is dependent upon the specific use. • For new mixed-use projects which incorporate both residential and neighborhood-serving commercial retail or service uses, the zoning administrator may reduce or waive up to fifty (50) percent of the required off-street parking requirement for the ground-floor commercial retail or service uses, subject to a zoning administrator's special permit.

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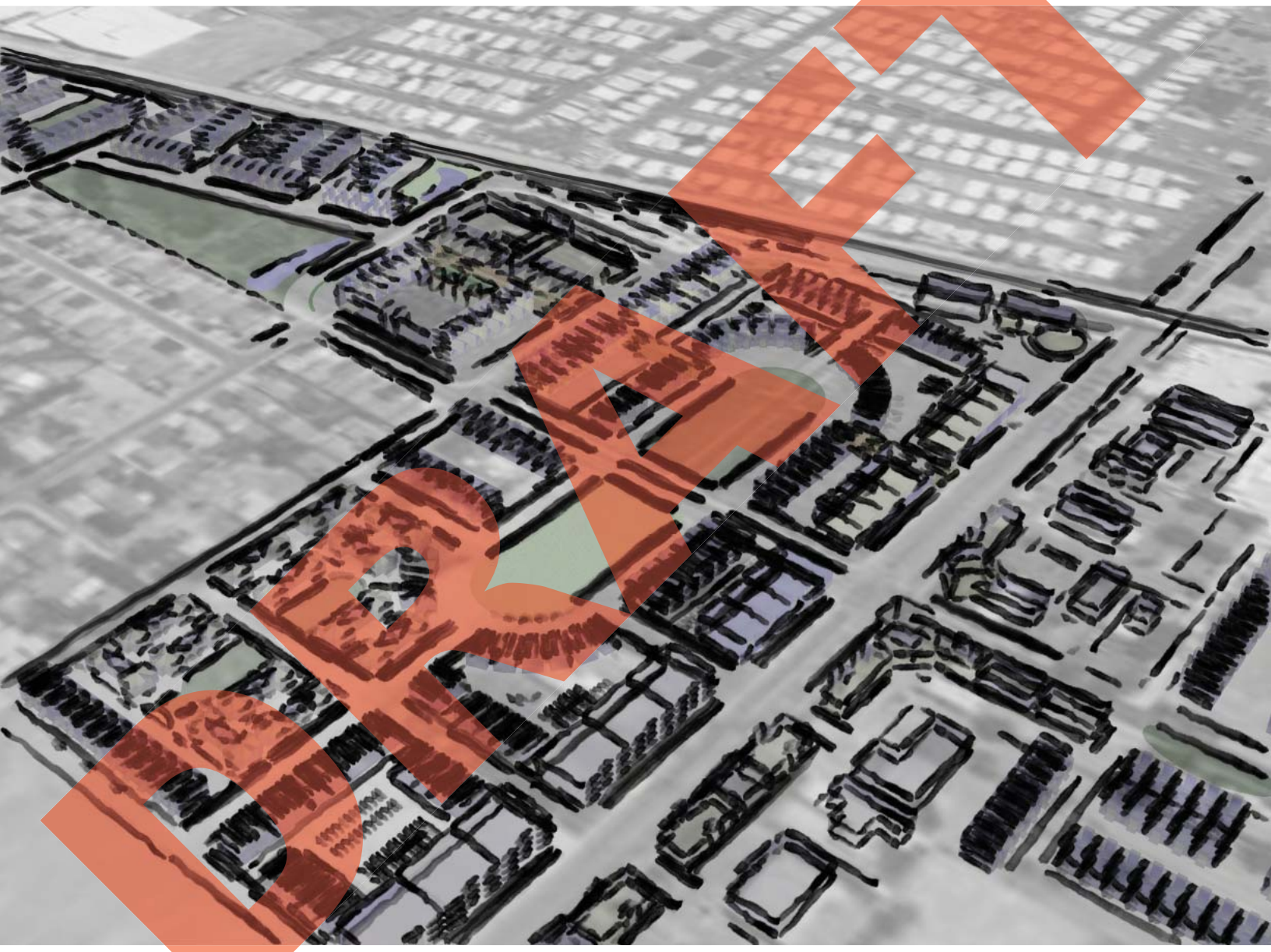
FLORIN ROAD STATION AREA

TRANSIT ORIENTED DEVELOPMENT (TOD) CONCEPT AND GUIDELINES



Technical Appendices

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CONCEPTUAL STORM DRAIN SYSTEM DESIGN SUMMARY

The proposed development of the Florin Light Rail Station will require the design and installation of storm drain systems adequate to contain and convey the 10-year flows to the existing storm drain systems on Florin with no increase in peak discharges. The development includes converting the existing parking lots and open space that currently occupy the areas to medium-high density residential and commercial areas.

The proposed conceptual storm drain design has been analyzed using Sacramento Storm Water Management Models (SacSWMM). The models were developed from the current condition models of the Basin 33 (which includes the Meadowview area) and Basin 54 (which includes the Florin).

Based on the SacSWMM models of the proposed layouts, detention storage is required. The approximate volume of detention storage required for the Florin Station development area is 1.5 acre-ft. Detention design may incorporate underground and/or above ground storage subject to City approval. The detention design should be installed at a location close to the most downstream point of the development. This will provide the maximum benefit while simplifying the design. For the analyses presented in this report, detention storage was modeled as vertical storage wells connected close to the most downstream end of the developments.

Grading of the development sites should provide adequate above ground (street) storage to mitigate any increase in the 100-year storm. The objective of the grading will be to reduce offsite discharge of 100-year storm flows to pre-development conditions. In addition, the 100-year design event water surface elevations should be considered in setting the building pad and threshold elevations.

1 Introduction

1.1 Background

The development area that this report discusses is defined by a roughly 1 mile radius semicircle centered on the existing Florin Light Rail Transit (LRT) station in the City of Sacramento, California and bound to the east by the LRT alignment.

This area has been targeted for redevelopment including plans to significantly increase the residential density. Parsons Brinckerhoff Quade & Douglass, Inc (PB) of Sacramento was contracted to assist in the planning stage of the project and PB has contracted with WRECO to develop a conceptual sanitary sewer system plan and study for the conceptual development plan.

1.2 Objective

The objective of this report is to outline the conceptual storm drain design, summarize the hydraulic analysis, and provide guidance and considerations for further development of the design. The conceptual storm drain design presented is based on the preferred layout configuration Florin 1B as presented by PB.

1.3 Location

The existing LRT station is located in the southern part of the City of Sacramento along the axis of the LRT tracks whose alignment is roughly north-north west to south-southwest. Florin station is several miles from the Sacramento River.

1.4 Planned Development

The planned development consists of a mixture of development types. These include areas of single-family homes, town-homes, multifamily residential, mixed-used (i.e., residential with

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commercial in the ground story), commercial, and public open space. These areas are all in addition to the LRT station, which includes structured parking and transit supportive uses.

PB and its architect sub-consultant developed several development scenarios. Among these, WRECO was asked to evaluate Florin 1b scenario. Subsequently, Florin 1b was modified but the planning level estimates provided by this report remain adequate for guidance.

1.5 Existing Systems

The City of Sacramento already has a completely built sanitary storm drain system surrounding the development area.

Florin Development Area

The Florin development area is part of the City 'Sump 54' storm drain basin. The Sump 54 basin encompasses approximately 243 acres, including the ±60 acres encompassed by the proposed Florin development area. Flows are collected along the street and routed via storm drains to trunk lines located along Florin Road and Gardendale. The trunk lines flow west to 24th where they come together at Sump 54 located along Anderson Slough.

2 Layout Design

2.1 General

The conceptual drainage design layout for the Florin development areas is shown on page 8.

For the conceptual storm drain design, the receiving facilities were identified and the most practical route for the proposed storm drains was established. This route considered the requirement of sufficient number of facilities to provide efficient drainage of the areas served. Manholes (nodes in the hydraulic model) were placed along the storm drains. These nodes generally have a particular catchment area associated with them and will be designed with inlets sufficient in capacity to drain the 10-year design storm with no flooding.

Grade and invert elevations for the conceptual design is primarily based on approximate existing grade elevation with consideration to the elevation at which the proposed systems will tie into existing systems. The minimum pipe slope used is 0.5% to insure adequate flow velocities, and the minimum pipe diameter used is 12-inches.

2.2 Florin Development Area

In general, the conceptual storm drain design for the Florin development area follows the lay of the land, and drains from higher grade elevation to lower. Generally the lay of the land is from north to south-south-west. The development areas south of Florin Road are mostly very flat and might drain with a slight counter-slope. The flows are collected by an existing trunk line flowing west along Florin.

2.3 Design Guidelines

A list of proposed guidelines for design and hydraulics of the storm drain systems is as follows:

- Recommended pipe materials to be used include RCP (Class 3) to meet the design velocity, flow capacity, and bearing capacity required at the site. Variations may be acceptable as long as it meets City of Sacramento design guidelines.
- Manning's 'n' value will be 0.015 for RCP.
- Minimum pipe full velocity of 2 ft/s.
- All pipes should have a minimum of 18 inches of cover from the sub-grade.
- Placement of the pipes will be per City guidelines except where this conflicts with existing utilities, in which case design is subject to the approval of the City.

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3 Hydrologic and Hydraulic Analyses

3.1 General

Hydrologic and hydraulic analysis of the proposed drainage system was done using the SacSWMM software. The conceptual design models were developed from existing SacSWMM models for Sump 54 (Florin Development Area) and Sump 33 (Meadowview Development Area) provided by the City of Sacramento.

3.2 Model Description

The SacSWMM model is made up of two modules: the Runoff Module and the Extran Module. The Runoff module is made up of the rainfall data and the catchment data. The rainfall data is input as rainfall intensity for each time-step of the model. The information input for each of the modeled nodes (catchments) includes:

1) Node Number
2) Catchment Width
3) Catchment Area
4) Percentage of the area that is impervious
5) Catchment overland slope
6) Manning's 'n' for the impervious area
7) Manning's 'n' for the pervious area
8) Storage (abstraction) on the impervious area
9) Storage (abstraction) on the pervious area
10) Initial infiltration rate
11) Final (minimum) infiltration rate
12) Decay rate of infiltration rate

The Extran module is made up of conveyance element data, junction data, and storage data. More data types (including pump data, orifice data, and weir data are included but were not modified, nor created in our models.

The information input for each conduit in the conduit data includes:

1) conduit number
2) Upstream and downstream nodes (junctions)
3) Size and shape of the conduit
4) Length of the conduit
5) Flowline elevation of the conduit relative to both the upstream and downstream junction inverts.
6) Manning's 'n' values
7) Shape and configuration of the overflow (street) section (if applicable)

The information input for each junction in the junction data includes:

1) Junction (node) number
2) Grade elevation
3) Invert elevation
4) Constant flow at junction
5) Cumulative length of curb inlets immediately tributary to the node
6) Curb inlet weir coefficient

The storage data includes the following information:
1) Junction (node) number
2) Crown elevation of the storage node

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3) Storage geometry (either in cubic feet per foot elevation or in stage-area pairs)

3.3 Output Description

The output of the Runoff module is inflow hydrographs at each of the various nodes. This output is used during the execution of the the Extran Module by applying the hydrographs at each node to the junction data from the Extran Module input. The Extran Module output includes detailed temporal data for each of the elements defined in the model.

4 Detention Storage

4.1 General

The conceptual drainage design for the Florin development area utilizes detention storage to reduce the post-development peak hydraulic grade line at the most downstream end of the development areas. The effective result of using storage means there is equal or less stress on the receiving facilities than in the pre-development condition.

4.2 Conceptual Design

Based on an iterative process of sizing the detention and comparing the model results to the predevelopment results, the approximate required detention volume for the Florin development is 1.5 acre-ft. The City of Sacramento's SacSWMM specialist Martin Farber aided WRECO in developing a stable hydraulic model of the detention storage.

The location of the detention facilities is not definitive, but the final design of the detention facilities should be analyzed to determine adequacy in reducing the hydraulic grade line at the downstream end of the project area to predevelopment conditions. Schematics of the analyzed detention facilities are shown on page 9.

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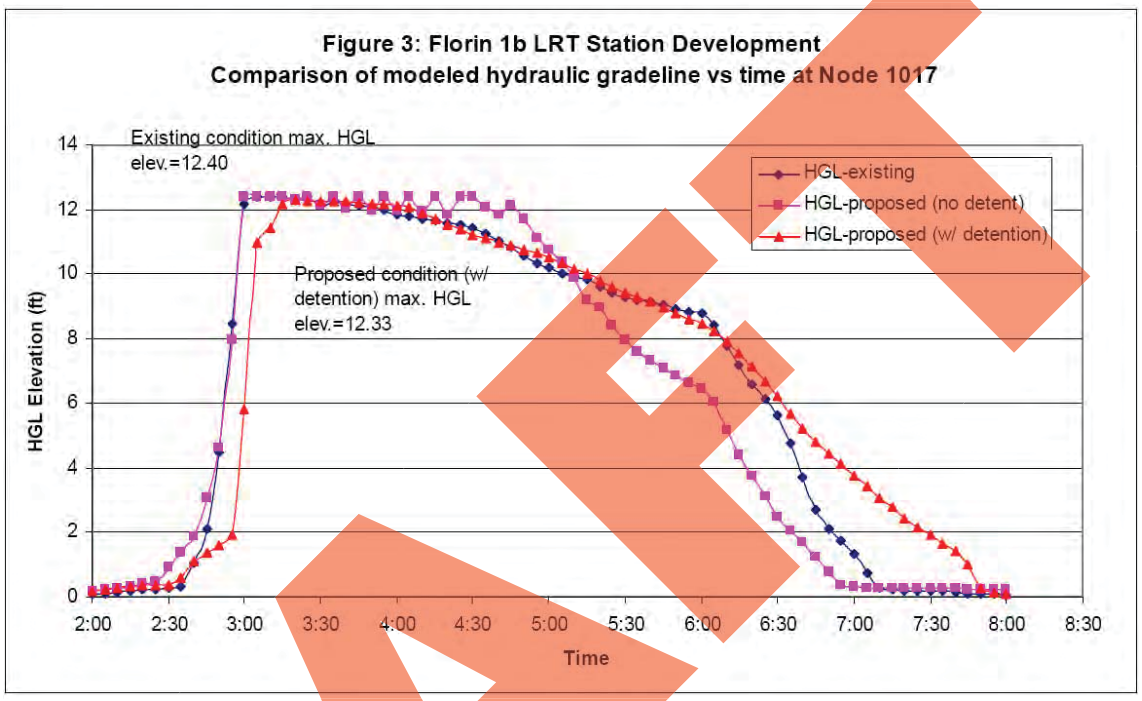
4.3 Results

The following figure shows a comparison of the hydraulic grade at the most downstream point in the Florin development area.



4.4 Alternatives

Some possible alternatives to the design and location of the detention facilities include:

1) above ground detention basin – can act as a water quality facility as well
2) below ground detention vault
3) below ground detention pipe arrays

Possibilities for supplemental reduction in hydraulic grade line for the Florin development include:

1) conversion of the open space (designated park land) at the 24th street cross-over to 25ths street into a detention facility
2) discharge to the Anderson Slough at the crossing under Florin Road (just west of the development area)

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5 Cost Estimate

A cost estimate of the storm drain facilities presented in the conceptual plan has been developed. A summary of the cost estimate is shown below:

Table 3: Conceptual storm drain design cost estimate for Florin development area

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item
1	620904	12 IN. APC	LF	8104	$45.72	$370,515
2	620908	15 IN. APC	LF	663	$57.91	$38,396
3	620909	18 IN. APC	LF	2053	$59.44	$122,022
4	920913	24 IN. APC	LF	2405	$68.58	$164,935
5	920913	* 27 IN. APC	LF	1079	$70.00	$75,530
6	707050	Drainage Inlet	EA	99	$2,000.00	$198,000
7		5FTx5FT RCB culvert	LF	105	$250.00	$26,250
8	707051	Drainage Manhole	EA	99	$3,500.00	$346,500
9		Detention Basin*	EA	1	$215,000.00	$215,000
*based on $100/ft for 1700 feet 72" corrugated pipe (~1.1acre-ft)						
					Construction Total	$1,557,148

6 Summary and Recommendations

The conceptual design of storm drain system for the Florin development area is a good starting point for the development of the final design documents

Major considerations in the development of the design of the Florin development include:

1) The inclusion of detention facilities sufficient to reduce the 10-year peak flow from the development to pre-development levels.
2) Grading the development area in such away to provide sufficient surface storage for the 100-yr event without increasing peak surface discharge from the site.
3) Designing the top of slab and finished floor elevations of the buildings to be above the 100-year flood elevations.
4) Incorporation of acceptable and permanent Best Management Practices.

The objective in refining the detention facilities design will be to fit the facilities into the design, size the facilities appropriately, and provide the city with a representative SacSWMM model which shows that there is no negative impact to the stress (hydraulic grade line) on the receiving systems. This design effort should be pursued with coordination with the City of Sacramento for development of an acceptable plan.

Grading the development area to decrease the peak overland discharge from the site to predevelopment levels is complicated by the changes in the overland flow destinations. Conditional to acceptance by the city, an appropriate location for a target (existing condition) overland flow value might be the peak value at the most downstream junction for the respective development areas. This corresponds to the SacSWMM models' Junction 1017 for Florin. The grading can be modeled as 'wine-glass' storage nodes, or by appropriate surface geometry definitions in the conduit cards. Contingent on successful grading of the development areas, consideration of the model results should be used to insure that 100-year water surface elevations are below the proposed buildings' threshold elevations.

The City of Sacramento has indicated several storm water management techniques for water quality. These accepted BMPs include:

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1) WQ/Detention basin
2) Vegetated swales
3) Sand filters
4) Pervious pavements
5) Jensen Precast Concrete storm vault

The successful development of the final design plan for the storm drainage in Florin LRT development area is dependant on the compliance and coordination with the City of Sacramento. The conceptual design presented has been evaluated by the City and is principally acceptable.

7 References

City of Sacramento 1990, "Design and Procedures Manual and Improvement Standards", City of Sacramento Department of Public Works, September 1 1990.

City of Sacramento 1996, "Sacramento Storm Water Management Model", Montgomery Watyson, January 1996.

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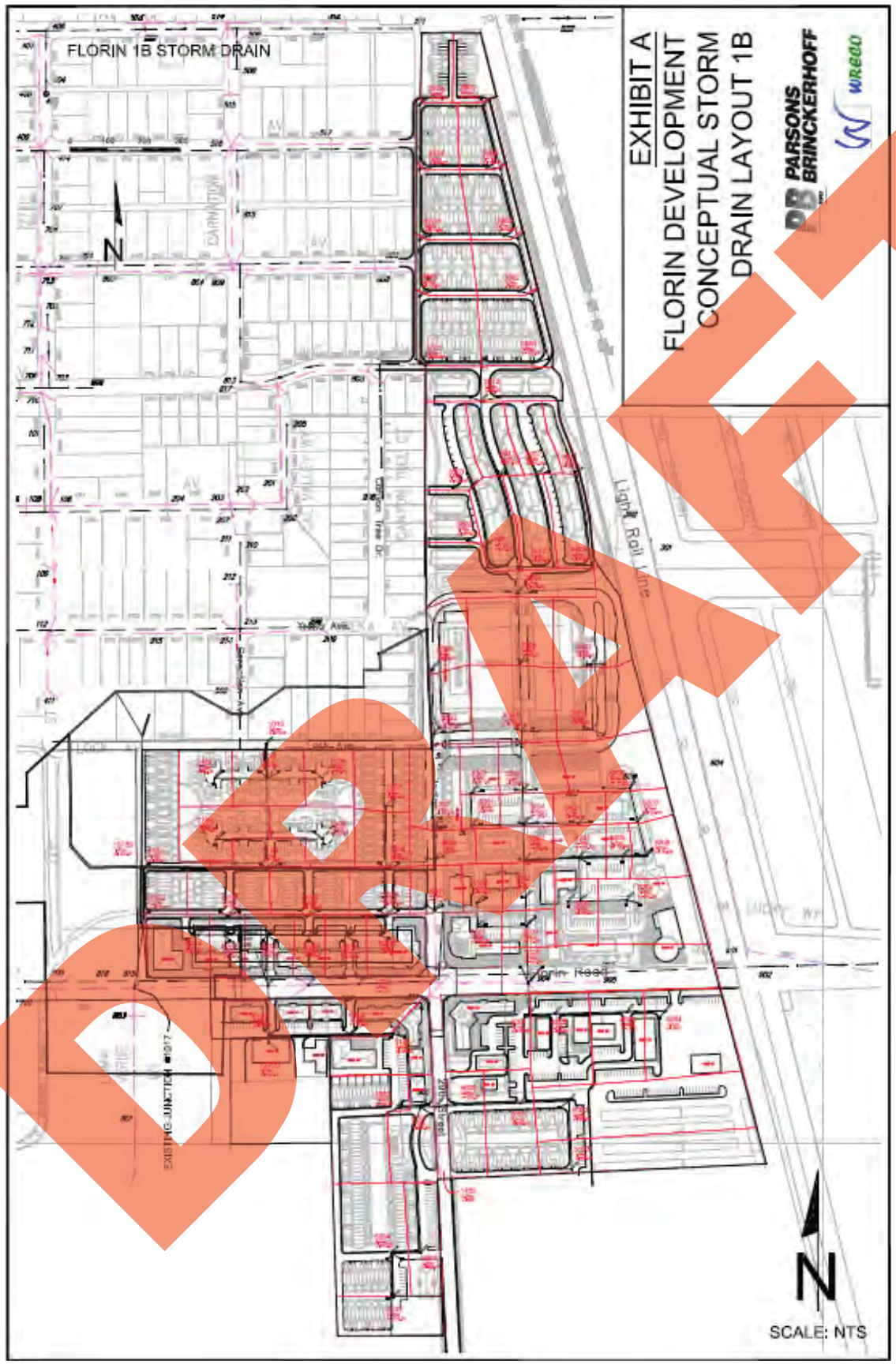
EXHIBIT A
FLORIN DEVELOPMENT
CONCEPTUAL STORM
DRAIN LAYOUT 1B
PARSONS BRINCKERHOFF
WRECO
FLORIN 1B STORM DRAIN
Light Rail Line
Florin Road
EXISTING JUNCTION #917
N
SCALE: NTS

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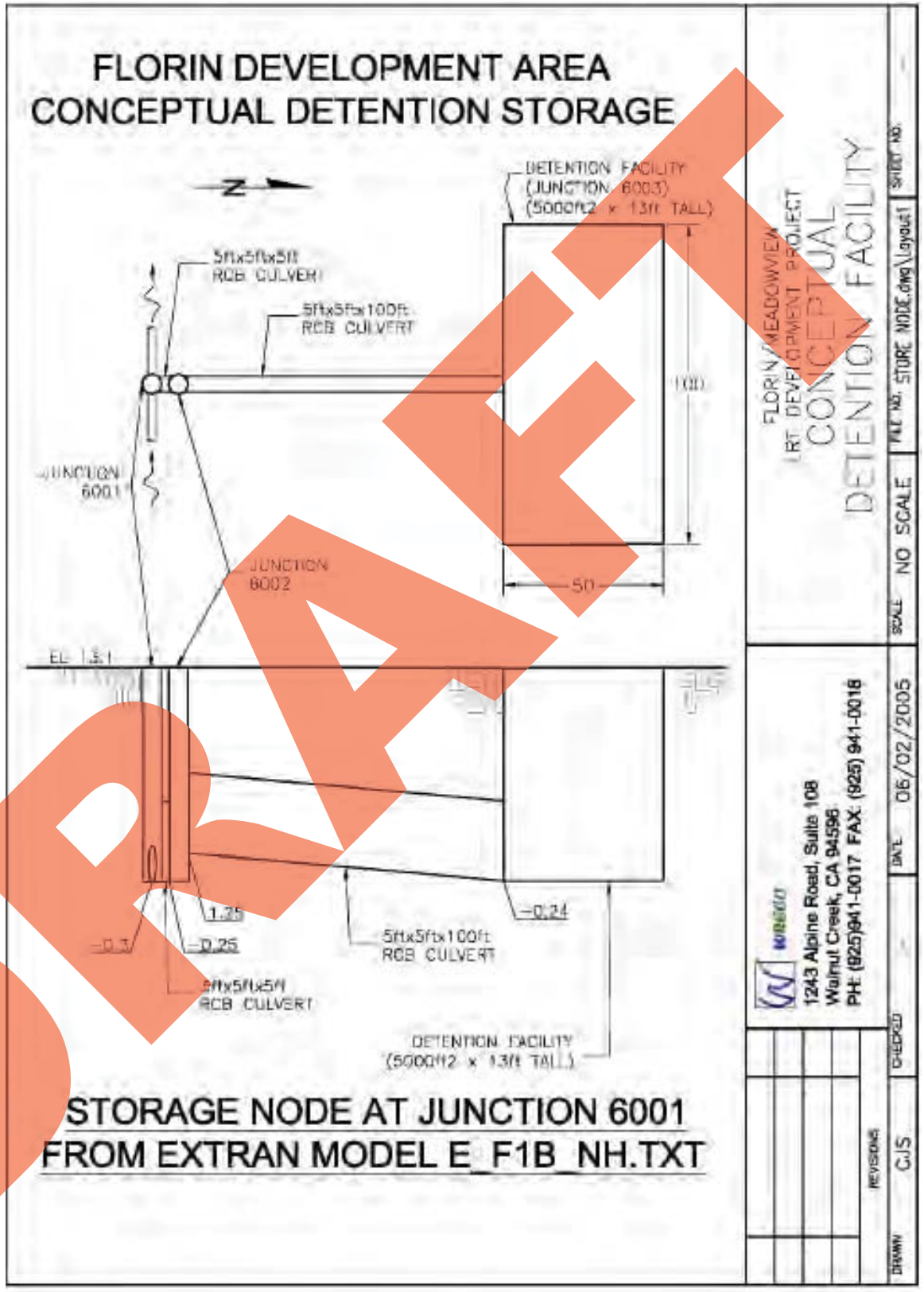
FLORIN DEVELOPMENT AREA
CONCEPTUAL DETENTION STORAGE
N
DETENTION FACILITY
(JUNCTION 6003)
(5000ft2 x 13ft TALL)
5ftx5ftx5ft
RCB CULVERT
5ftx5ftx100ft
RCB CULVERT
100
JUNCTION
6001
JUNCTION
6002
50
EL 1.51
1.25
-0.3
-0.25
5ftx5ftx5ft
RCB CULVERT
5ftx5ftx100ft
RCB CULVERT
-0.24
DETENTION FACILITY
(5000ft2 x 13ft TALL)
STORAGE NODE AT JUNCTION 6001
FROM EXTRAN MODEL E_F1B_NH.TXT
FLORIN MEADOWVIEW
LRT DEVELOPMENT PROJECT
CONCEPTUAL
DETENTION FACILITY
SCALE NO SCALE
FILE NO. STORE NODE.dwg\Layout1
SHEET NO.
DATE 06/02/2005
CHECKED
DRAWN CJS
REVISIONS
1243 Alpine Road, Suite 108
Walnut Creek, CA 94596
PH: (925)941-0017 FAX: (925) 941-0018

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CONCEPTUAL SANITARY SEWER SYSTEM DESIGN SUMMARY

Transit-Oriented Development is planned for the area in the vicinity of the Florin Light Rail Transit (LRT) station in the City of Sacramento, California (City). Parsons Brinckerhoff developed conceptual development plans and contracted with WRECO to develop a conceptual sanitary sewer system for this plan.

Flow monitoring data indicate that the existing sanitary sewer systems surrounding the area have insufficient available capacity to accommodate all of the new flow generated by the planned development. The main at Meadowview Road west of 24th Street, is downstream of the areas' system and has sufficient capacity. An additional constraint is that the existing system is at the extreme upstream end of the larger area sanitary sewer system and, consequently, invert depths are relatively shallow.

The conceptual sanitary sewer system design was developed following the City's design criteria, guidance from City staff and standards of hydraulic engineering practice. The layout allots as much flow as possible to the existing system by connecting buildings near the development zone boundaries to the nearest existing mains. For the remainder of the flow, the design includes gravity systems that drain to sewage lift stations located in the middle of the development zone. The design further includes several thousand feet of new force main from the lift stations to the main at Meadowview Road west of 24th Street.

The report recommends building new force mains as a solution to the limited existing system capacity rather than storage tanks because the tanks would need have several million gallons of capacity to safely store flow from peak flow period for later release during low flow periods. The report also includes conservative estimates of new pipe lengths, trench lengths broken down by trench depth, and lift station pump sizes.

1 Introduction

1.1 Background

The Development Zone that this report discusses is defined by a roughly one mile radius semicircle centered on the existing Florin Light Rail Transit (LRT) station in the City of Sacramento, California and bound to the east by the LRT alignment. This region has been targeted for redevelopment including plans to significantly increase the residential density. Parsons Brinckerhoff Quade & Douglass, Inc (PB) of Sacramento are assisting in the planning stage of the project and PB has contracted with WRECO to develop a conceptual sanitary sewer system plan and study for the conceptual development plan.

1.2 Objective

WRECO prepared the conceptual plan and study primarily to determine what measures will be necessary to guarantee sufficient capacity for the conceptual development plan. In addition, the plan was developed to suggest general guidelines for laying out a more finalized sanitary sewer system in the future.

1.3 Location

The existing LRT station is located in the southern part of the City of Sacramento along the LRT tracks, which is oriented approximately from north-north west to south-southeast. The Florin area is about three miles from the nearest Sacramento County Sanitation District Number One (District) intertie.

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1.4 Planned Development

The planned development zone consists of a mixture of development types. These include areas of single-family homes, townhomes, duplexes, multifamily residential buildings, mixed-used (i.e., residential with commercial in the ground story) buildings, commercial buildings and public space.

These areas are all in addition to the LRT station, which include structured parking and transit supportive uses. The table below summarizes the characteristics of the planned development zone that were analyzed for the conceptual sanitary sewer system. Subsequently, these assumptions were modified but the planning level estimates provided by this report remain adequate for guidance.

Table 1. Florin Area Planned Development Summary

Description	Units	Footprint Extent	
		(ft^2)	(acres)
Townhouses	191		
Flats	191		
Medium Density	372		
Live-Work	122		
Duplexes	56		
Mixed Use-Commercial		111,754	2.57
Transportation Corridor		12,800	0.29
TOTALS	932	124,554	2.86

1.5 Existing System

The City of Sacramento already has an existing sanitary sewer system surrounding the development area (see Figure 1). A main under Florin Road collects most of the flow from the area surrounding the Florin development area. This main then drains to the main under 24th Street, which drains to a sewage lift station along 24th Street near Casa Linda Drive. The lift station then pumps flow to a main under Meadowview Road at the point where the main widens to an 18 in pipe on the west side of the Meadowview Road/24th Avenue intersection. A separate District main in Florin Road also collects flow in the Florin area and drains to the east.

Most of the Florin area flow drains to the Meadowview main. The Meadowview main, in turn, drains to a 96 in Sacramento County Sanitation District main running under Freeport Boulevard, about 1.5 miles west of 24th Street. In the past, the area likely drained to the now-decommissioned Meadowview Sewage Treatment facility.

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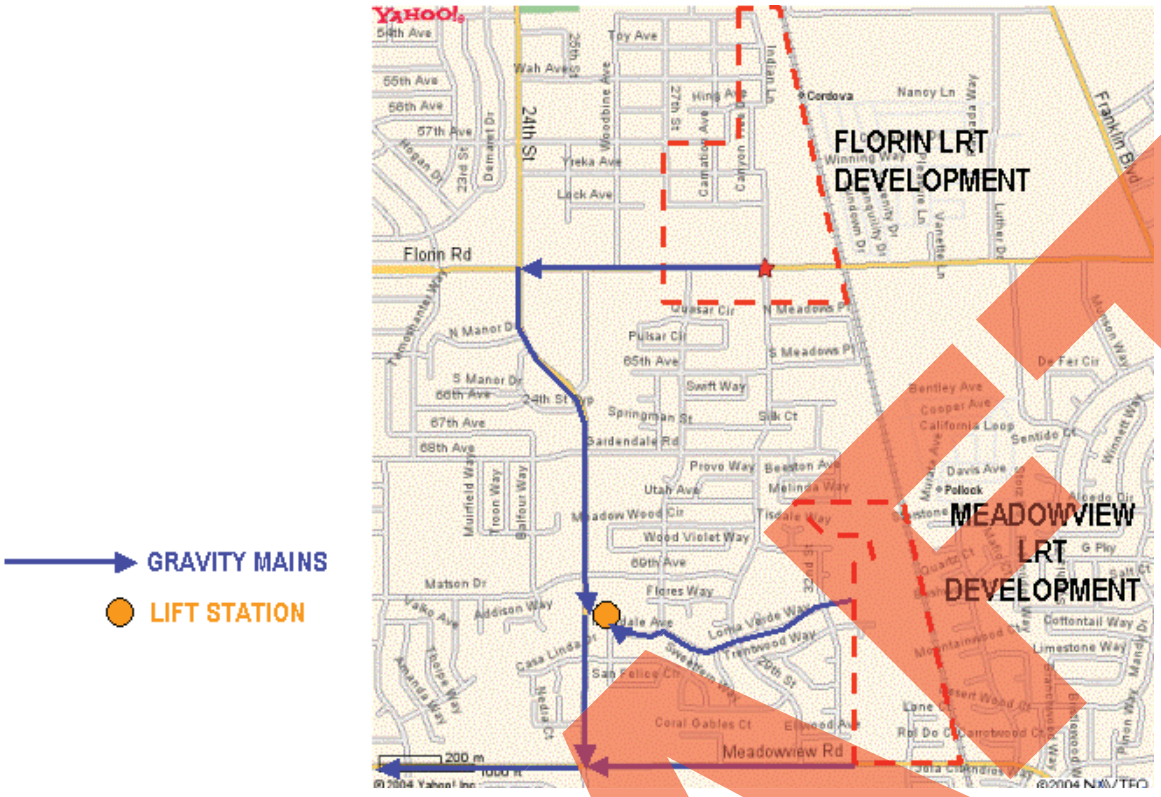

Figure 1

1.6 Constraints & Opportunities

Sacramento is a city built on flat land. Consequently, gravity-based sanitary sewer systems can travel only a limited distance before requiring a lift station to continue moving flow through the system, particularly when the system experiences peak flows.

Also, the Florin development zone is at the extreme upstream end of its City sanitary sewer system and that system was apparently designed with no more than single family home-level density in mind. Consequently, the mains in the immediate vicinity of the development zone for which data were available for this study are relatively shallow and have little remaining capacity. In fact, many of those mains are already operating at or near capacity. No capacity data were available for the District sewer system.

2 Analysis

2.1 Design Flow Estimate

WRECO estimated design flows for the Florin development zone based on the City's Design Criteria and PB's descriptions of the zones broken down by development type. The City's Design Criteria provide method for estimating flows per developed unit for domestic development and for all other types by determining equivalent developed units based on building footprint area.

Based on the method in the Criteria, flows for residential units were estimated based on the numbers of units and the density for each type of development. The Criteria specifically indicates higher per flows per developed unit for single family homes than for units in multi-family buildings, which is a typical assumption for estimating wastewater flow. Flows for other types of units

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Table 3. Florin Development Zone Sanitary Sewer Conceptual Design Flow

Type	Description	Units	Footprint Extent (ft²)	Equivalent DU's/1,000 ft²	Equivalent DU	Toal DU's	Average Flow (MGD)	Peaking Factor	Peak Design Flow (MGD)	Peak design Flow (cfs)
Domestic										
	Medium Density	372			0	372	0.112			
	Live-Work	122			0	122	0.037			
	Duplexes	56			0	56	0.017			
	Townhouses	191			0	191	0.057			
	Flats	191			0	191	0.057			
Commercial/Municipal/Industrial										
	Mixed-Use Commercial	0	111,754	0.2	22	22	0.007			
	Transportation Corridor	0	12,800	0.2	3	3	0.001			
	Total	932	124,554		25	957	0.287	2.7	0.778	1.204

2.2 Existing Sewer System Capacity

The City and Morton Pitalo[1] arranged for monitoring equipment to record flows at certain locations. These locations were chosen on sewer mains known to collect flow from the development area.

The following table lists the mains examined and where in the new development zones flow seen in the mains would originate, assuming the new development zones were to connect to the City's existing sanitary sewer system.

Table 5. Sewer Mains and Flow Allocation

Main No.	Location	Pipe Size (in)	Would Receive Flow From
1	Florin Road at 29th Street	10	Entire Florin Zone
2	Loma Verde Way at Meadowdale Ave	8	Northern part of Meadowview Zone – Single family homes
3	Meadowview Road at 29th St	12	Southern part of Meadowview Zone
4	Meadowview Road, east of 24th St	12	Southern part of Meadowview Zone - downstream of Main 3.
5	24th Street at Meadowview Road	15	Downstream of confluence of Mains 1 and 2 and existing lift station.
6	Meadowview Road, west of 24th St	18	Confluence of all flows from both zones

[1] Buzz Oates, the development company that owns the northern, single family home, portion of the Meadowview LRT Station Development Zone hired Morton Pitalo as a civil engineering subconsultant.

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Full Pipe Capacity

Full pipe capacities for the existing sewer system surrounding the development areas were estimated either using Manning's equation taking slope, diameter and material as arguments or reproduced from Morton Pitalo (2004), which also used Manning's equation.

Table 6. Full Pipe Capacities

Location	Full Pipe Capacity (cfs)
Florin Road at 29th Street	0.85
Meadowview Road at 29th Street	1.34
Meadowview Road, east of 24th Street	1.15
24th Street at Meadowview Road	1.94
Loma Verde Way at Meadowdale Avenue	0.58
Meadowview Road, west of 24th Street	4.53

Flow Monitoring

Monitoring equipment recorded flow in the mains every five minutes for at least 60 days at each location in order to determine maximum and minimum flows. The following table presents the results and remaining capacities based on the results. Remaining capacity is the capacity of a given pipe to carry additional flow above and beyond the maximum flow currently seen in the pipe and is equal to Full Pipe Capacity minus Maximum Observed Flow. Minimum Observed Flow is used for storage tank sizing.

Table 7. Monitoring Results Summary and Remaining Capacities

Location	Minimum Observed Flow (cfs)	Maximum Observed Flow (cfs)	Full Pipe Capacity (cfs)	Remaining Capacity (cfs)
Florin Road at 29th Street	0.22	0.47*	0.85**	0.38
Meadowview Road at 29th Street	0.10	0.55	1.34	0.79
Meadowview Road, east of 24th Street	0.15	0.86	1.15	0.29
24th Street at Meadowview Road	0.21	1.36*	1.94	0.58
Loma Verde Way at Meadowdale Avenue	0.03	0.29*	0.58	0.29
Meadowview Road, west of 24th Street	0.36	2.22	4.53	2.31

*Certain data points were not included in the analysis of the data. These were unusually high stage readings most likely due to temporary plugging of the weir in the monitoring device. Final consideration of the validity of this data sampling should be verified by the City of Sacramento Department of Utilities.
**Capacity based on slope indicated in original system design drawings. Neither as-builts nor survey for the Florin Road main were available.

2.3 Model

Hydraulic models of the conceptual sanitary sewer system were developed using Hydraflow StormSewers 2005. The model took surface elevation and flow data and was used to determine main size requirements in the system.

3 Results

3.1 Flow Monitoring

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The flow monitoring study results indicate the following:

- The existing main that would collect all flow from the Florin Zone has 0.38 cfs of remaining capacity
- The main that collects flow from both the Florin zone and the Meadowview zone areas, Meadowview Road west of 24th Street, has remaining capacity (2.31 cfs) sufficient to accommodate the estimated combined flow from the new developments (2.20 cfs).

4 Conclusions & Recommendations

4.1 Gravity Flow Accommodation

Shallow Mains

The mains nearest to the new development zones generally have inverts no lower than 7 feet below the existing land elevation. The new development zones will require extensive new mains, some of them over one thousand feet long. The mains collecting flow from the homes and buildings will flow by gravity and will reach depths far below the available existing main inverts, were they connected to those mains. Consequently, the existing mains immediately surrounding the zones can collect flow only from the development closest to those mains. For the remainder of the development, lift stations will be required to convey flow out of the zones.

Lift Stations

In a sanitary sewer system with a lift station, flows travel by gravity to a collection tank at the lift station. A pump then lifts the sewage out of the tank and impels it into a new main that flows under pressure (i.e., a "force" or "pressure main" rather than a "gravity main"). In order to minimize tank invert depth, the optimal location for a lift station is a location resulting in the minimum possible gravity main length, which is usually the center of the area that drains to the station.

4.2 Capacity

In addition to being shallow, the mains immediately surrounding the new development zone lack sufficient capacity to accommodate all the additional flow from the zone. The 18-inch main in Meadowview Road west of the intersection with 24th Street that collects flow from both the Florin and Meadowview zones, does have sufficient capacity for all the development, though. Consequently, the conceptual plan allots flow from the zones to make the best use of the available capacity by assigning some of the new mains to connect to the existing mains in the surrounding area.

After allotment of these areas that are nearest to the available mains surrounding the zones, conveying the new zones' remaining flow requires an approach to accommodate the lack of capacity in the nearby mains during peak flow periods. There are two principle ways to accomplish this: storage tanks and new/expanded mains.

Storage Tanks

The lift stations will already include sump tanks as a part of their design. These tanks, however, will be only large enough to maintain consistent flow levels in the force main. One method for accommodating limited capacity in the nearby mains is to only pump flow into those mains during off-peak times. Accomplishing this would require increasing the lift station sump tanks'

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storage capacity dramatically so that would be large enough to store several hours' worth of flow. The resulting tanks at either lift station would have several million gallons of capacity.

New/Expanded Mains

The second approach is to bypass or replace the mains with insufficient capacity. This approach would include either

- Construction of several thousand feet of new force main from both lift stations to the 18-inch main at Meadowview Road west of 24th Street
- Upgrading of the existing mains to sizes sufficiently large to accommodate flow from the zones and construction of new force main from the lift stations to the upgraded mains.

4.3 Suggested Alternative

WRECO's conceptual design includes construction of lift stations in the center of the Florin Development zone and installation of new force mains out to the main at Meadowview and 24th. The new force main alternative is considered preferable to the sump tank alternative primarily because of the exorbitant costs and odor issues of large sewage holding tanks. The following figure depicts the suggested alternative.

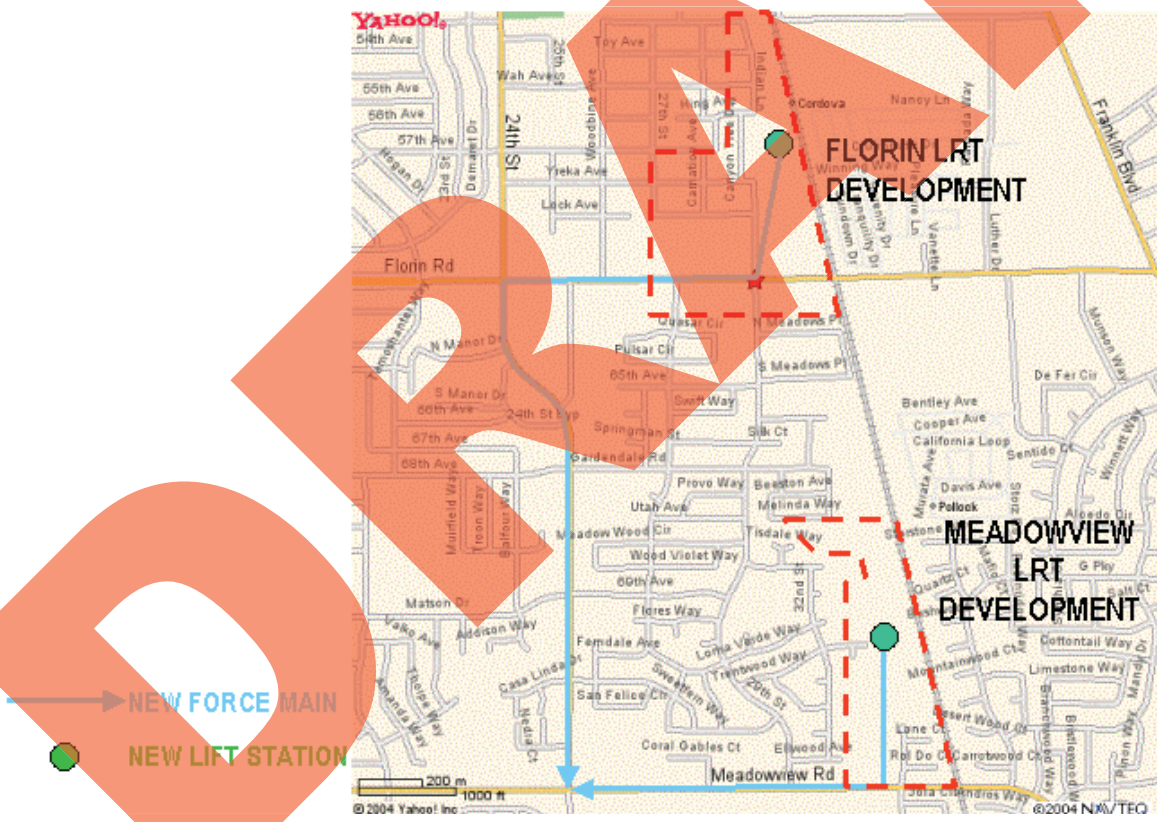

Figure 2

Conceptual Design

WRECO's conceptual sanitary sewer system design for the Florin Development Zone includes one lift station, with a main that flows under gravity from the edges of the zone toward a lift

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station in the middle. The conceptual layout on page 19 assumes connections to the existing system will collect flow from part of the zone and gravity mains draining to a lift station will collect the rest.

Trenching Depths

The following table lists pipe and trenching length estimates broken down by trench depth intervals for the conceptual sanitary sewer system. In order to provide a conservative estimate for planning purposes, the estimates given assume gravity mains sufficient to collect all flows in the zone.

Specifically, the estimates give length and trench depths for gravity mains extending to the extreme north and south ends of the zone to a lift station at the middle, as opposed to the shorter gravity main lengths in the conceptual layout, which assumes connections to the surrounding system.

Table 8. Preliminary Pipe and Trenching Quantities – Florin

Item Description	Estimated Length (feet)
8 in Force Main	8,300
Trench, Force Main, Shallow (5 ft - 8 ft)	8,300
8 in Gravity Main	13,680
10 in Gravity Main	600
Trench, Gravity Main, Shallow (5 ft - 8 ft)	11,700
Trench, Gravity Main, Mid-Depth (8 ft - 12 ft)	2,290
Trench, Gravity Main, Deep (12 ft - 15 ft)	280

Lift Station Sizing

The lift station will need to have sufficient pumping capacity to accommodate peak flow from the area and will require at least two pumps per station with that capacity to guarantee operability in the case of failure. Though the conceptual design assumes the lift station would collect only some of the flow from the surrounding area, the figures given in the table below are for planning and conservatively assume that the lift station will collect all flow in the zone.

Table 10. Preliminary Lift Station Sizing

Development Zone	Lift Height (ft)	Force Main Length (ft)	Required Capacity (gpm)	Recommended Single Pump Power (HP)[1]
Florin	18	8,300	540	15

[1] Pump power from FLYPS 2.1 pump selection software, assuming 8-inch steel pipe.

Sacramento County Sanitation District Number One System

A request was made to the District for capacity data for the District mains in the Florin area but the District staff stated that no such data were available. Consequently, the conceptual design assumed no connection to these mains. The District staff further stated that determining capacity in the area would require a request that the District perform a study. WRECO recommends that the City or another stakeholder make this request to the District as soon as possible on the possibility that the Florin area District mains may have capacity for additional

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flow. Any reduction in flow to the Florin lift station, or better yet, the elimination of the need for the lift station, will significantly reduce the total development project cost.

References

Morton Pitalo 2004, "Sewer Study for Meadowview Station, City of Sacramento, Sacramento, California", Morton & Pitalo, Inc., September, 2004.

City of Sacramento 1990, "Design and Procedures Manual and Improvement Standards", City of Sacramento Department of Public Works, September 1 1990.

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EXHIBIT A
FLORIN ZONE
CONCEPTUAL SANITARY
SEWER LAYOUT
PB PARSONS BRINCKERHOFF
WOREGO
NEW FORCE MAIN
NEW GRAVITY MAIN
EXISTING CITY GRAVITY MAIN
EXISTING COUNTY GRAVITY MAIN
N
SCALE: NTS

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CONCEPTUAL WATER SYSTEM DESIGN SUMMARY

Transit-Oriented Development is planned for the area in the vicinity of the Florin Light Transit (LRT) station in the City of Sacramento, California (City). Parsons Brinckerhoff developed conceptual development plans for the Florin zone and contracted with WRECO to develop conceptual water systems for this plan.

A water system layout was developed following the City's design criteria, guidance from City staff and standards of hydraulic engineering practice. Due to relatively low available pressure in the area, almost all pipe in the conceptual system design are 12-inch or larger in diameter.

WRECO also developed model scenarios depicting conditions in the Florin area under existing and proposed conditions using EPANET 2.0. The City's design criteria specify a residual pressure of 20 psi under 3,000 gpm fire flow conditions. Florin area existing condition pressure data indicate insufficient pressure to maintain 3,000 gpm at a 20 psi. The model-predicted data predicted that the conceptual Florin water system will be able to sustain 20 psi of residual pressure under 2,000 gpm fire flow conditions but not under 3,000 gpm conditions.

Pressure in the Florin zone under both existing and proposed conditions is insufficient to pressurize fire sprinkler systems.

1 Introduction

1.1 Background

The Development Zone that this report discusses is defined by a roughly 1 mile radius semicircle centered on the existing Florin Light Rail Transit (LRT) station in the City of Sacramento, California and bound to the east by the LRT alignment.

This region has been targeted for redevelopment including plans to significantly increase the residential density. Parsons Brinckerhoff Quade & Douglass, Inc (PB) of Sacramento are assisting in the planning stage of the project and PB has contracted with WRECO to develop a conceptual water supply system plan and study for the proposed development.

1.2 Objective

WRECO prepared the conceptual plan and study primarily to determine what measures will be necessary to guarantee sufficient capacity for the proposed development. In addition, the plan was developed to suggest general guidelines for laying out a more finalized water supply system in the future.

1.3 Location

The Florin LRT station is located in the southern part of the City of Sacramento adjacent to the LRT tracks whose alignment is roughly north-northwest to south-southeast. Florin station location is relatively flat and surrounded by flat terrain for several miles.

1.4 Planned Development

The planned development consists of a mixture of development types. These include areas of single-family homes, townhomes, multi-family residential, mixed-used (i.e., residential with commercial in the ground story), commercial and public space. These areas are all in addition to the LRT station, which includes structured parking transit supportive uses.

1.5 Existing System

The City of Sacramento already has a completely built water supply system surrounding the Florin development zone. The area includes larger pipes such as the 12-inch transite main along

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Indian Lane but most of the existing system surrounding the area consists of 6-inch transite laterals and mains with the occasional 8-inch transite main.

1.6 Constraints & Opportunities

Sacramento is a city built on flat land flat city next to the state of California's largest river. Consequently, its water supply system can supply a great volume of water but system pressures are lower than for other comparable cities' water systems.

2 Available Data

The City of Sacramento provided system pressure and elevation data for the Florin area. The table below summarizes the pressure data used in the study.

Table 1. Florin Area System Pressure Data		
Location	Static Pressure (psi)	Design Flow @20 psi (gpm)
Hing Avenue/Canyon Tree Court	37	2,243
Indian Lane/Lock Avenue	38	2,396
Florin Road/Indian Lane	38	2,934
65th Avenue/29th Street	39	2,967
Source: Ewart, B (2005)		

System and elevations were estimated in the Florin area based on Lidar data from the City. HLA's drawings served as the source for types and numbers of proposed new developed units for the purpose of estimating ordinary non-fire flow demands. Cadastral data adapted from the City's water system maps served as the source for the existing system pipe network.

3 Conceptual Design

WRECO developed a conceptual system layout for the Florin area. The system layout includes pipe alignments, sizes, and materials and specifies where the new water lines connect to the existing water systems. The system design follows City criteria that all new water systems consist of 8- inch pipe for laterals and 12-inch pipe for mains. The complete system layout is displayed on page 19.

4 Analysis

Model

The hydraulic analysis was performed using EPANET 2.0, available from the US Environmental Protection Agency. The program uses a simultaneous matrix solution algorithm to determine pressure throughout a water supply system based on user-defined data. All pressures were determined based on the Hazen-Williams formulation.

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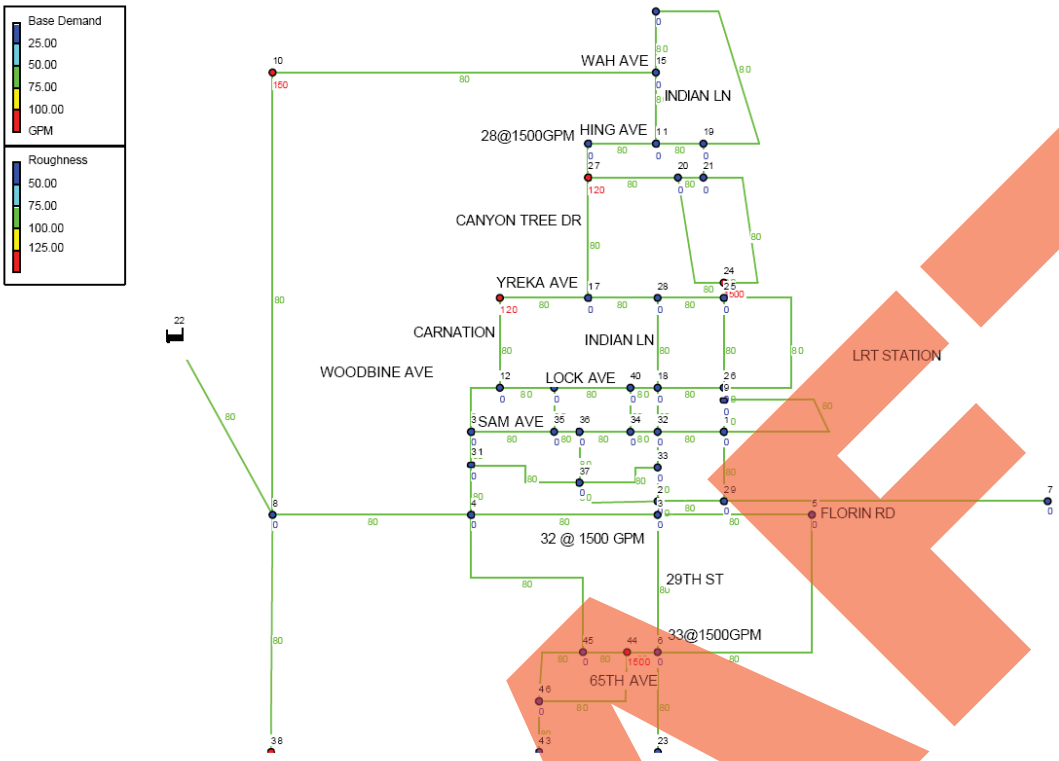

Figure 2. Florin EPANET2 Model Pipe Layout

System Layout

Pipe alignments, sizes and materials were reproduced from WRECO's conceptual water system design for the Florin area and the existing water system. A Hazen-Williams friction factor of 80 was assumed for the transite pipe making up the existing system and a friction factor of 120 was assumed for new pipe. The value for new pipe is standard for new steel pipe and conservative for new plastic pipe.

The system layout followed general guidelines for laying out water systems, with pipes joined to complete several loops in the area, allowing a large number of flow pathways to any point in the system. In addition, following City staff instructions, all new pipe was either 8-inch or 12-inch and the new system in the Florin zone was connected to the existing system in as many separate locations as possible.

Model Assumptions

- Pressure drop from main to fire hydrant represented by a 30 foot length of 6-in pipe with a Hazen-Williams coefficient of 120 for all fire flow scenarios.
- Minor losses were not modeled

Regular Demand- Existing Use

Demand for the existing units surrounding the areas was estimated by calibration of the existing model networks based on static and fire flow pressure data. Specifically, demands were determined by beginning with assumed values and proceeding towards values that resulted in pressures matching known conditions by trial-and-error. The demands determined for the surrounding area by this method were as follows.

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System Pressure

An examination of the available static and residual pressure distribution indicates that the Florin area receives water primarily from a single reservoir to the west. The model scenarios were set up to reflect this situation and the effective reservoir water surface elevations were estimated based on the known system static pressure nearest to the water supplies.

Regular Demand- New Development

The analysis used the City's Design Standard to determine peak regular (non-fire flow) and fire-flow demands for the proposed new development based on the numbers of units and extents of the different development types. The following table summarizes these demands:

Table 3. Florin Area Non-Fire Flow Peak Demand by Sub-Zone

Density Code	Description	Density	Extent (acres)	Units	Combined Demand (gpm)
R-1A	Single Family Alternative	Medium	3.65	56	24.5
R-2A,B	Multi-Family	Medium	17.57	406	63.4
R-3	Multi-Family	High	5.87	106	16.6
RM X	Residential Mixed Use	Medium/High	13.58	273	42.7
C-1	Limited Commercial		13.26		64.2
TC	Transportation Corridor		2.07		10.0
				TOTAL	221.4

The City's Design Standard specifies that the supply system must be able to sustain 3,000 gpm with at least 20 psi of residual pressure in areas with high residential density or commercial development and 2,000 gpm for areas of low density residential development. The demand corresponding to the appropriate density was placed within each of the sub-zones making up the proposed development, in addition to existing and proposed non-fire demands. Within each zone, several different locations were tested and results were recorded for the lowest predicted residual pressure in each zone.

The zones were as follows:

Table 5. Florin Model Test Locations

Development Type	Location
LRT Station	Southeast
Townhomes	North
Multi-Family Housing	North Central
Townhomes/Duplexes	Southwest Central
Mixed Use Commercial	South Central & Southeast Central
Townhomes	South

5 Results

5.1 Water System Layout

The proposed water system layout for the new development zone included 37 new pipe links for the Florin zone. The following table summarizes the total pipe lengths by diameter for cost estimation.

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Table 7. Estimated Water System Pipe Length Requirements		
Development Zone	12-inch Pipe	8-inch Pipe
Florin	12,410	1,610

5.2 Model

The City specifies 3,000 gpm with a minimum 20 psi residual pressure for domestic development denser than single family housing and for commercial development. All of the planned Florin zone development falls into one or the other of these development categories and the Florin area existing condition system pressure data indicated that neither the existing nor any proposed system could sustain the City-specified criterion. Consequently, scenarios were chosen to predict the maximum available fire flow with a 20 psi residual pressure in the system rather than predict residual pressures at the specified fire flow. The table below summarizes the results from these scenarios.

Table 8. Florin Model Results		
Location	Static Pressure (psi)	Fire Flow at 20 psi (gpm)
Southeast	37.9	2,410
North	36.2	2,100
North Central	35.7	2,180
Southwest Central	38.8	2,540
South Central & Southeast Central	39.7	2,600
South	39.7	2,500

As the table above shows, the model results predict that the proposed water systems in the new development zone will have flows and pressures similar to those under existing conditions. That is, the Florin zone will sustain 2,000 gpm fire flows at 20 psi but not 3,000 gpm flows. There the Florin area will not maintain pressure in the range required to pressurize building fire sprinkler systems.

6 Conclusions & Recommendations

Pressure Criteria

The data from the City for the Florin area indicate that the existing system pressure would be insufficient to provide 3,000 gpm at 20 psi, regardless of future development.

The EPANET 2.0 model results indicate residual pressures above 20 psi at all locations in the new system in the Florin zone under 2,000 gpm fire flow conditions. In the Florin area, the new system will not be able to sustain 20 psi at 3,000 gpm flows. This is consistent with the City data for the existing system, which, as mentioned, is already insufficient to meet the 20 psi at 3,000 gpm criterion. Consequently, the Florin area will require one or more booster pumps in the commercial and dense residential zones to have sufficient pressure to meet the City's 20 psi at 3,000 gpm requirement for those development types

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Fire Sprinklers

Pressures in the system will not be sufficiently high to pressurize most fire sprinkler systems. This is inevitable, however, since the existing system, even without further development, cannot provide such the sufficient pressure (40 psi) except under static conditions. City staff indicated that boosting to fire sprinkler system pressure will be left to developers.

References

Morton Pitalo 2004, "Water Supply Study for Meadowview Station, City of Sacramento, Sacramento, California", Morton & Pitalo, Inc ,September, 2004.

Ewart, B., 2004, Memorandum to Ulysses Hillard, "Distribution System Boundary Conditions for Florin Station", dated February 11, 2005.

City of Sacramento 1990, "Design and Procedures Manual and Improvement Standards", City of Sacramento Department of Public Works, September 1 1990.

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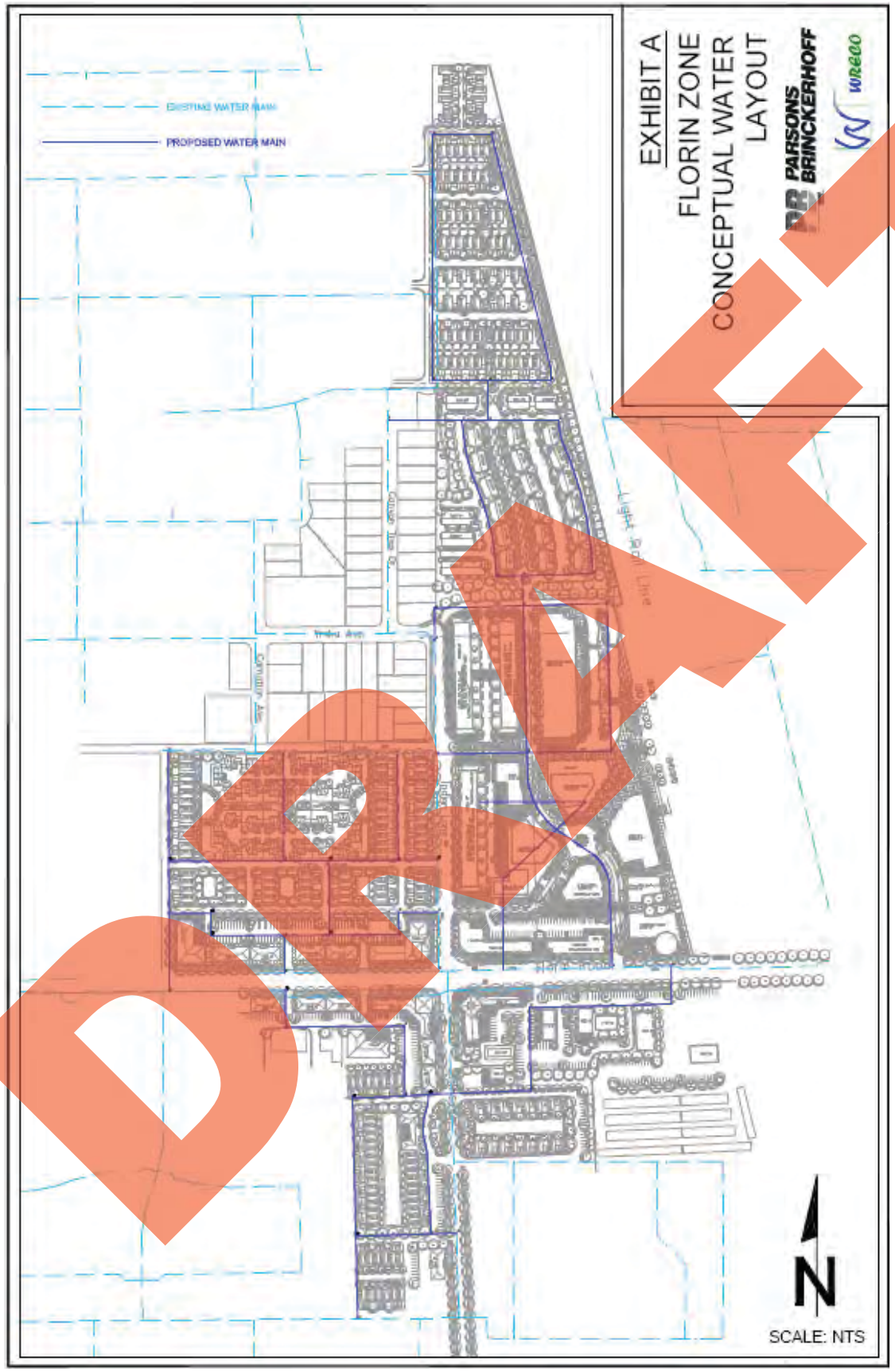
EXISTING WATER MAIN
PROPOSED WATER MAIN
EXHIBIT A
FLORIN ZONE
CONCEPTUAL WATER
LAYOUT
PARSONS BRINCKERHOFF
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SCALE: NTS

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CONCEPTUAL TRAFFIC ANALYSIS SUMMARY

1. Existing Transportation System

Roadway System

Florin Road has two lanes in each direction separated by a center left-turn lane in the vicinity of the Florin LRT Station. It has a posted speed limit of 40 miles per hour. The segment directly east of the station is estimated to carry approximately 31,000 vehicles per day.

Traffic signals are situated on Florin Road at 29th Street/Indian Lane (access to LRT Station), Luther Drive, and Franklin Boulevard. The Florin Road/29th Street/Indian Lane and Florin Road/Luther Drive intersections currently operate at Level of Service (LOS) C or better during the weekday AM and PM peak hours. The Florin Road/Franklin Boulevard intersection operates at LOS D and E, respectively, during these peak hours.

Bicycle/Pedestrian System

Sidewalks exist on both sides of Florin Road from west of Indian Lane to beyond the Southline LRT grade-separation of Florin Road. Sidewalks exist on the east side of Indian Lane adjacent to the Florin LRT Station. Bike lanes are not currently provided on Florin Road or Indian Lane.

The sidewalks in the vicinity of the LRT grade-separation of Florin Road are not "pedestrian friendly". The sidewalks "wrap around" the crossing arms for the at-grade heavy rail tracks, resulting in less than two feet of usable area for pedestrians. The sidewalks directly under the LRT grade-separation are three feet wide and do not have a raised curb for separation between the adjacent travel lanes. Field observations indicate that high school students walking to/from the Florin LRT Station cross Florin Road just west of the LRT grade-separation (often waiting in the landscaped median for gaps in traffic). Very few students were observed to use the pedestrian traffic signal located east of the LRT grade-separation at the Luther Burbank High School entrance.

Transit System

The Florin LRT Station is one stop from the current southerly terminus (at the Meadowview Station) of the Southline light rail service. In 2005, an estimated 2,600 boardings and alightings occured at this station each weekday. Bus routes 54, 65, and 81 stop at the station.

Transit Parking

The station currently has 1,076 parking spaces. Regional Transit provided parking demand information for January through May 2004. During an average weekday, 97 spaces, or 9 percent of the available supply, were occupied. The maximum observed parking demand was 130 spaces.

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2. Florin TOD Travel Characteristics

Trip Generation/Mode Split

	AM Peak Hour	PM Peak Hour	
Gross Trips	660	1,230	
Internal Trips (25%)	- 170	- 310	
Pass-By Retail Trips[2]	- 10	- 90	
Transit Trips[3]	- 70	- 140	11%
External Vehicle Trips	410	690	58%

Trip Distribution

We estimated the expected distribution of trips onto the surrounding roadway system based on existing travel patterns and complementary land uses. The following distribution percentages were assumed for the purposes of this study:

Direction	Percentage
To/From the east on Florin Road	65%
To/From the west on Florin Road	20%
To/From the south on 29th Street	15%

3. Traffic Forecasts/Operations Analysis

Traffic levels on Florin Road directly east of the Florin Station TOD are expected to increase from approximately 31,000 vehicles per day under existing conditions to 40,000 vehicles per day under cumulative conditions with the TOD developed.

Table 1 summarizes the existing and cumulative average delay and LOS at each intersection.

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[2] 10% of AM peak hour and 25% of PM peak hour trips by retail uses assumed to be "pass-by".
[3] Transit mode share is 20% for retail/public uses, 15% for office, and 10-12% for residential.

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Table 1 Intersection Operations							
Intersection	Traffic Control	AM (PM) Peak Hour					
		Existing Conditions		Cumulative Conditions without Florin Station TOD		Cumulative Conditions with Florin Station TOD	
		Average Delay	LOS	Average Delay	LOS	Average Delay	LOS
Florin Road/Indian Lane/ 29th Street	Traffic Signal	20 (22) sec/veh	C (C)	24 (29) sec/veh	C (C)	29 (44) sec/veh	C (D)
Florin Road/Luther Drive	Traffic Signal	15 (13) sec/veh	B (B)	16 (16) sec/veh	B (B)	16 (18) sec/veh	B (B)
Florin Road/Franklin Boulevard	Traffic Signal	51 (70) sec/veh	D (E)	78 (74) sec/veh	E (E)	83 (85) sec/veh	F (F)

Table 1 shows that traffic from the Florin Station TOD would cause cumulative traffic impacts (according to criteria from the City of Sacramento *Revised Guidelines for the Preparation of Traffic Impact Analysis Study*, January 2002) at the following intersections:

- Florin Road/Indian Lane/29th Street (LOS C to D during PM peak hour); and
- Florin Road/Franklin Boulevard (cumulatively unacceptable operations exacerbated by virtue of delay increasing by more than five seconds during the AM and PM peak hours).

Potential mitigation measures for these impacts have not been analyzed. However, the lack of available right-of-way in the vicinity of both intersections may limit the range of possible mitigations. Based on the number of new vehicle trips, it is estimated that the non-residential land uses contribute about 70 percent of the new traffic and the residential uses contribute about 30 percent.

Revised level of service thresholds are being consider as part of the General Plan 2030, which may revise the potential impact in the cumulative condition with project scenario at Florin Road/Indian Lane/29th Street during the PM peak hour to less than significant.

Some project trips are likely to use adjacent neighborhood streets such as Sam Avenue, Lock Avenue, Yreka Avenue, and 57th Avenue for travel to/from the north (toward 47th Avenue). However, this would not represent a significant proportion of project trips given that the area to/from the north is primarily residential and has few employment or shopping-related attractions.

4. Project Access Considerations

The following describes some of the key issues relating to access to the Florin Station TOD.

Florin Road provides multiple accesses to the commercial uses.

The commercial parcels situated along Florin Road will have several accesses. The attached figure displays a recommended access plan. As shown, the driveways on either side of Florin Road closest to Indian Lane would be restricted to right-turns, while the driveways farther west would take advantage of the center left-turn lane to permit all movements. Opportunities for access are also provided from 27th Street, Indian Lane, and 29th Street. Although no land use

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changes are contemplated along the south side of Florin Road east of 29th Street, consolidation of driveways is proposed in order to reduce the number of conflict points between vehicles, bicyclists, and pedestrians.

Improvements should be considered at the Florin Road/29th Street/Indian Lane intersection.

Improvements should be considered at this intersection to improve pedestrian safety and eliminate the "offset" for northbound through traffic (i.e., motorists must transition about 12 feet to the right within the intersection to access the receiving lane). Opportunities for improving operations include:

- modify the pedestrian phase on the west leg so that it occurs only with the southbound left/through/right movement,
- redesignate the northbound and southbound lanes to eliminate the offset and provide for protected left-turn phasing, and
- operate the northbound right-turn movement with an overlap arrow.

Since some of these options have drawbacks, further analysis and collaboration with City of Sacramento DOT staff would be necessary to identify the preferred improvements.

Improvements should be considered on Florin Road in the vicinity of the LRT grade-separation to improve pedestrian safety.

The following improvements should be considered to discourage pedestrian crossings of Florin Road between Indian Lane and the pedestrian traffic signal at the high school entrance:

- Widen the sidewalks under the LRT overcrossing.
- Install within the Florin Road median a wrought iron fence (with pointed posts) and/or thorny/dense landscaping to physically discourage pedestrian crossings
- Add signage to Florin Road to direct students to the pedestrian traffic signal.

Widen the sidewalk on the north side of Florin Road adjacent to the Florin Station.

The existing sidewalk (approx. 4 to 5 feet wide) along the Florin LRT Station frontage should be widened to at least 12 feet. This width will accommodate the increased pedestrian activity in the area associated with the TOD. It will also provide an opportunity for bicycle travel (i.e., a bike lane is not provided on Florin Road), thereby making this path a joint use bicycle/pedestrian facility.

5. Internal Circulation Considerations

The Florin Station TOD site plan is conceptual. Therefore, our evaluation of internal circulation focuses primarily on the core internal roadways, pedestrian linkages, and bus routes. More detailed aspects of the TOD such as the locations of sidewalks, open space/landscaped areas/shading, internal bicycle connections, ADA elements and compliance, parking garage access(es), and other design features should be evaluated as development applications are received and considered.

In 2005, parking demand for the light rail station ranged from an average of about 100 occupied spaces to a maximum of 130 occupied spaces. A detailed evaluation of the proposed parking supply should be conducted when specific land uses (including parking supply) are proposed for the site.

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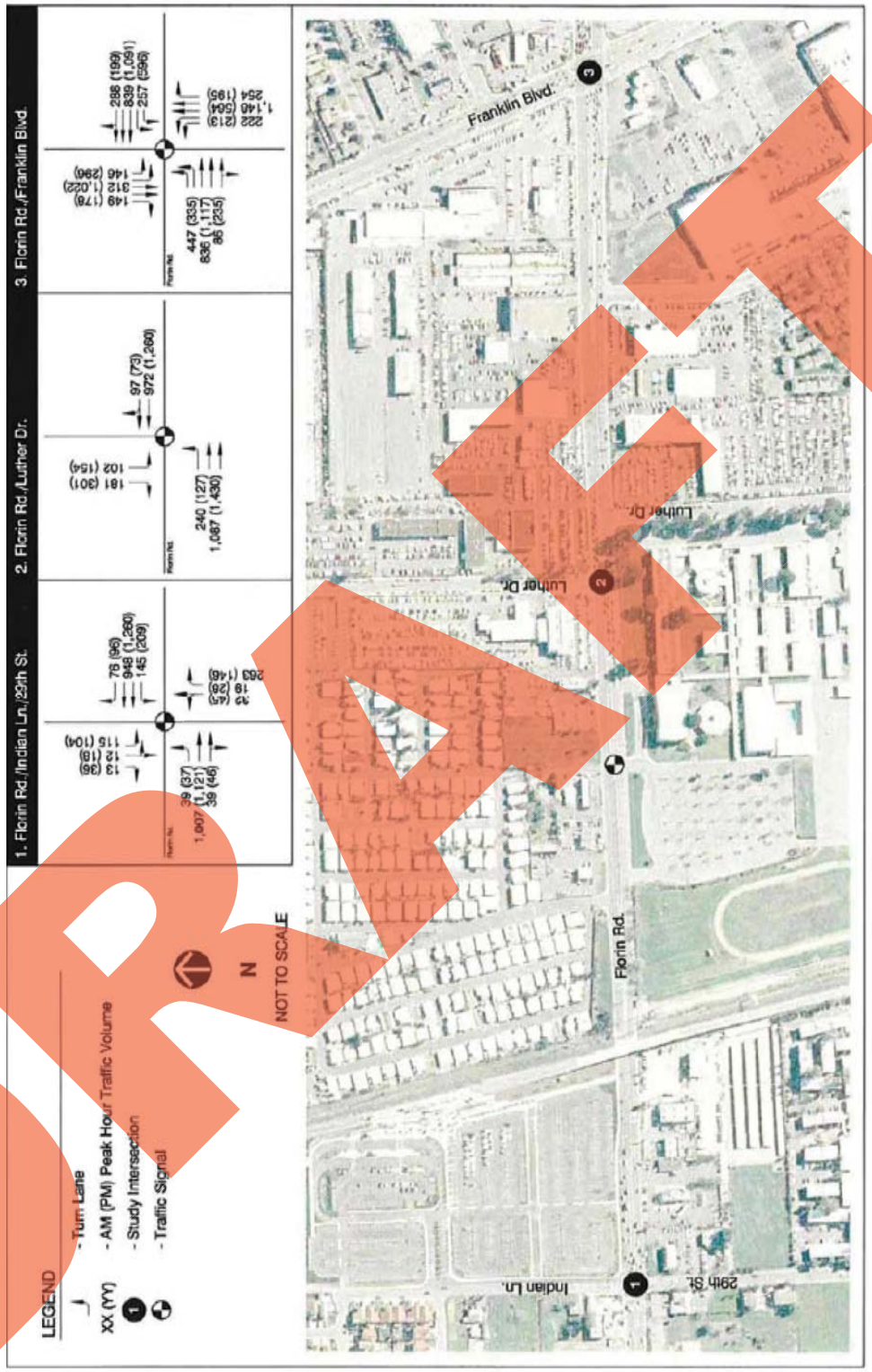

PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - EXISTING CONDITIONS

FIGURE 1

FEHR & PEERS
TRANSPORTATION CONSULTANTS

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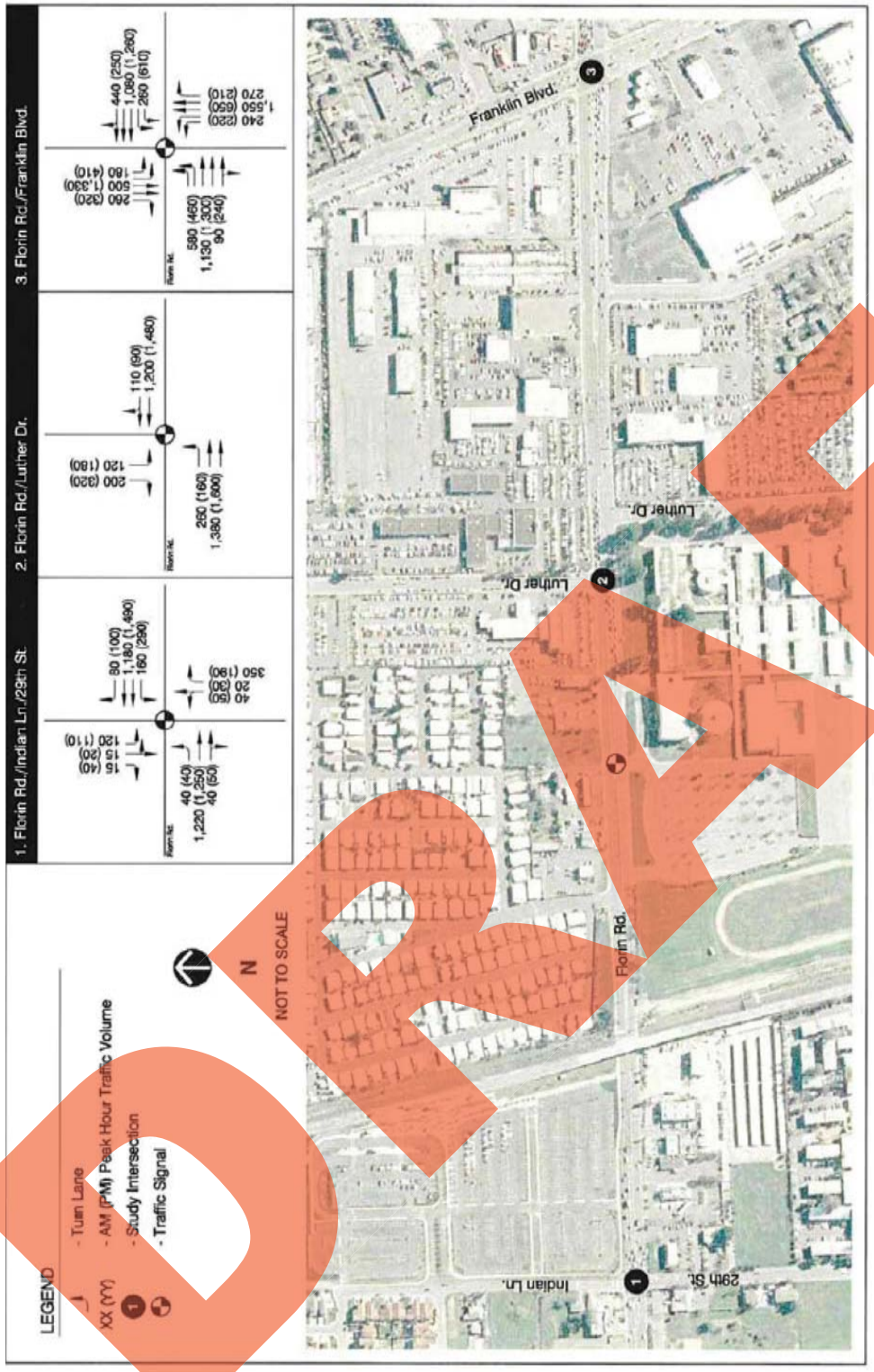

PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - CUMULATIVE NO PROJECT CONDITIONS

FIGURE 2

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TRANSPORTATION CONSULTANTS

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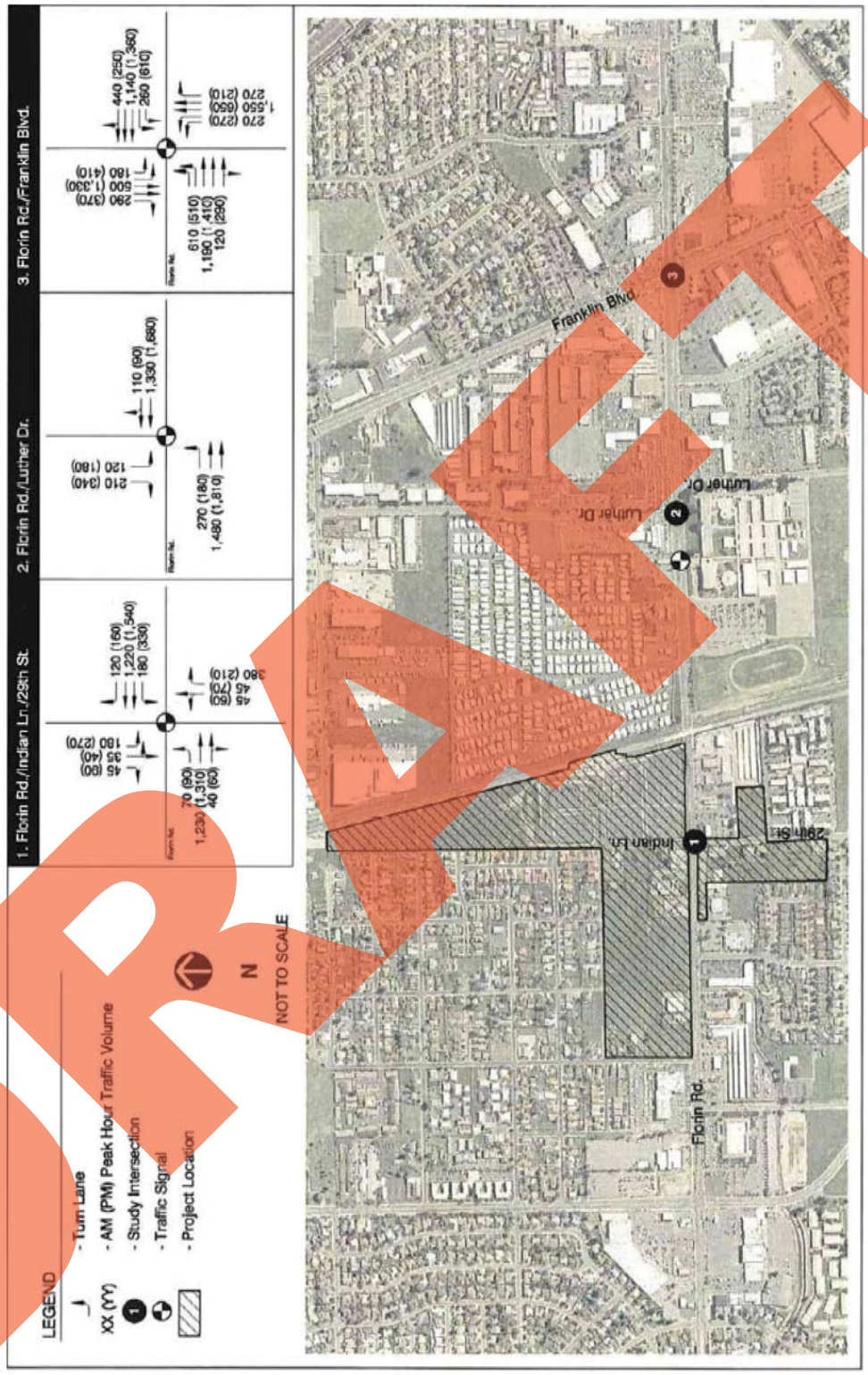

PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - CUMULATIVE CONDITIONS WITH FLORIN ROAD STATION TOD

FIGURE 3

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TRANSPORTATION CONSULTANTS
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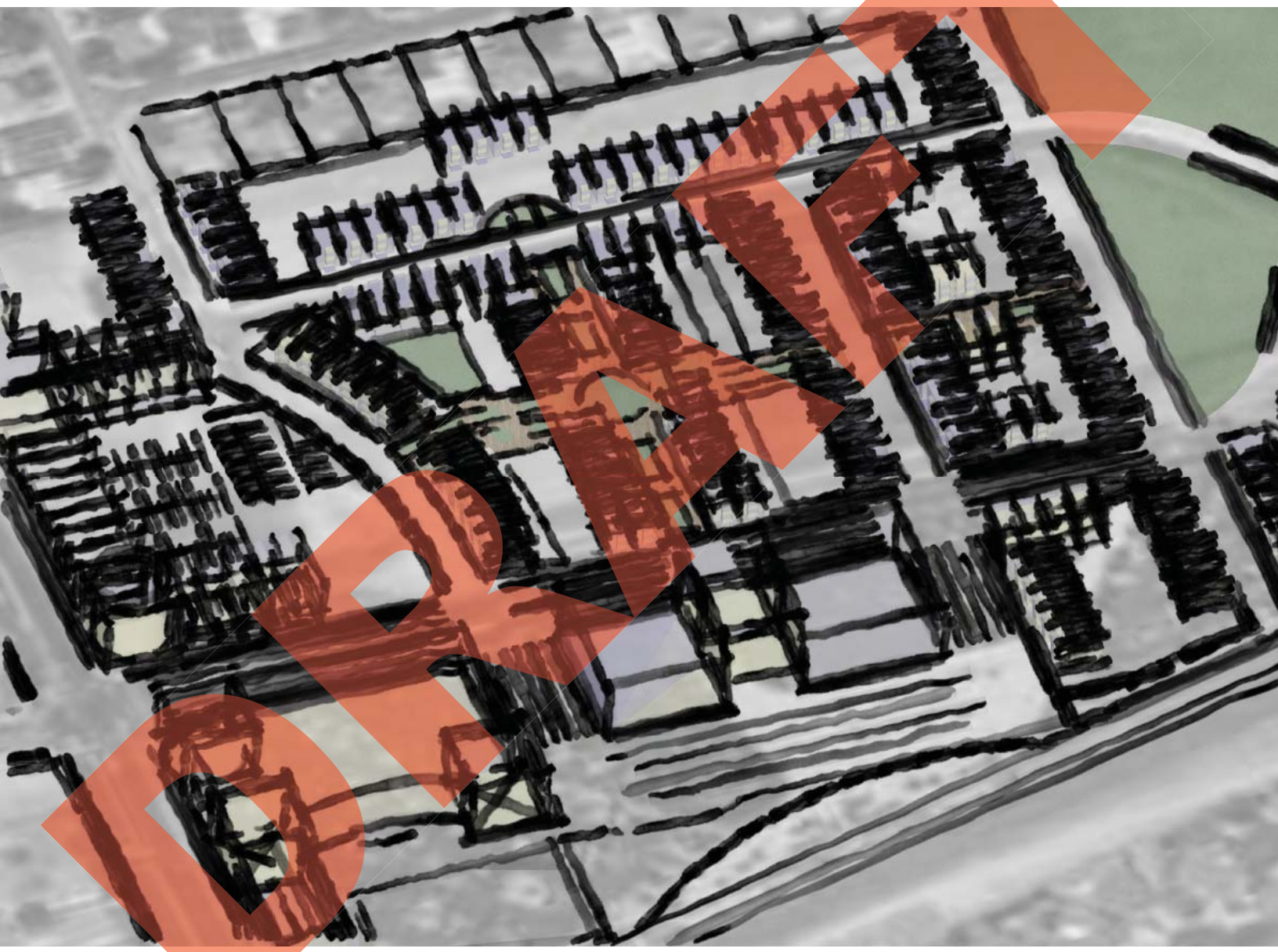
MEADOWVIEW ROAD STATION AREA

TRANSIT ORIENTED DEVELOPMENT (TOD) CONCEPT AND GUIDELINES



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Department of Transportation

January 2009

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MEADOWVIEW ROAD STATION AREA

TRANSIT ORIENTED DEVELOPMENT (TOD) CONCEPT AND GUIDELINES

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CITY OF SACRAMENTO
Department of Transportation
January 2009

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PURPOSE

At the Meadowview light rail transit station (Meadowview Station), there is a tremendous opportunity to provide quality development which is oriented towards and compatible with the Sacramento Regional Transit (RT) system. Figure 1 illustrates the general location of the Meadowview Station. It is the goal of the city of Sacramento to have this area develop in a transit oriented development (TOD) - friendly manner. Achieving this goal will provide mixed-use housing opportunities for a variety of citizens while improving the opportunities to use rail transit for trip-making – thus providing travel options to new residents, while reducing greenhouse gas emissions and travel in the region, as well as reducing traffic congestion in the immediate area.

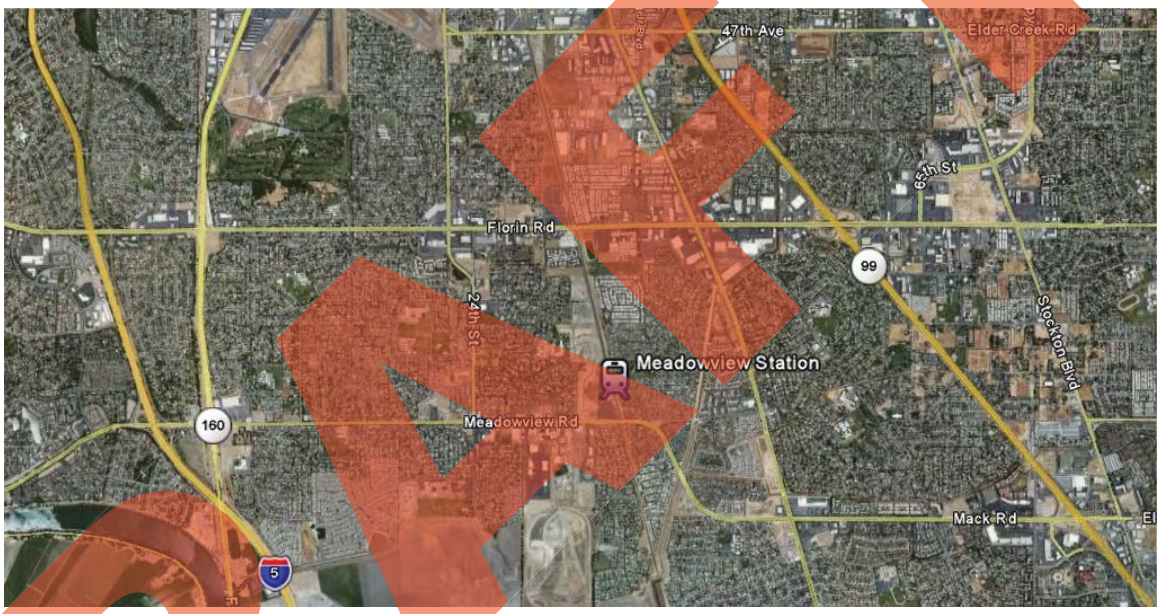

Figure 1 Meadowview Road Station Location

This document should not be construed as a Specific Plan for the area and the information and concepts presented herein have not been environmentally cleared through the California Environmental Quality Act (CEQA). This document does provide both general and specific guidance and direction to future development of the area that will help achieve the goal of the city. Should future development generally follow the guidelines contained herein, it is anticipated that the development review process will recognize this consistency and thus will be less complex and time consuming to achieve – when compared to an alternate development strategy which does not work towards the achievement of the city's goal. Saving time for future development implementation is a key purpose of this document. The other key purpose is to develop a set of guidelines for the Meadowview Station that will help guide transit-oriented development at that location.

It should be noted that the concepts presented herein reflect an increased densification of the Florin Road Station area, as well as the introduction of key themes into the development approach. Alternative concepts also exist (including most importantly a greater densification than proposed herein) which could also meet the city's goals. Nothing in this document should be construed as either restricting nor discouraging *increased* density above the levels proposed herein, should the market dictate. However, options that *decrease* density below the levels proposed herein are not consistent with the spirit and intent of this document and must be recognized as such.

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BACKGROUND

It is the intent of the city of Sacramento in producing this document to provide the development community with a general guide for developing the Florin Road Station area in a manner consistent with TOD-friendly principles, while being responsive to the community and decision-maker's vision at the time of the study completion. Translating the concepts from this document into a market-responsive development at the Florin Road Station will become a tremendous accomplishment with regional benefits in Sacramento.

GENERAL THEMES FOR THE MEADOWVIEW ROAD STATION AREA

This document consists of six distinct, but interconnected, sections. The sections are:

- Background ~ provides an overview of the station area and the development objectives to achieve and for which this *Concept and Guidelines* has been prepared;
- Development Framework ~ the land use, transportation and parks components are presented as guidance;
- An Illustrative Plan ~ Describes how the land use, transportation and parks "fit" into one design concept;
- The Development Program ~ Describes in greater detail the various land uses recommended as guidance, as well as illustrative examples; and
- The Design Guidelines ~ Presents the various "design principles" and architectural concepts that are most important to fulfill the intent of the TOD concept for the Florin Road Station Area.
- A *Zoning Table* which provides a comparison of the categories of land use that are recommended in the Plan with the City of Sacramento's current zoning code. As the General Plan 2030 is being developed, there maybe some modifications to the existing Zoning Ordinance, that may change these designations in this *Zoning Table* and would need to be updated herein.

The following key general themes or concepts for the Meadowview Road Station area work together to achieve the desired goal of a TOD-friendly development. The key themes are:

- **Forward Looking**
  The Meadowview Station Concept Plan acknowledges and builds upon the land use opportunities created by the extension of the South Line LRT to Cosumnes River College. Following this extension, access to the Meadowview Station will shift from predominantly park and ride to pedestrian and shuttle access

- **Transformative**
  The development concept/program relates to the communities and land uses that surround the station site. The plan includes retail space appropriately sized for a community supermarket, which was a need established in early meetings with the community. The market is proposed at street level, with some or all of its parking above, and the option of relatively high density residential units.

- **Pedestrian Friendly**
  The neighborhood is structured into a pedestrian-friendly design with low-traffic and parking either curbside or behind residential development screened from the street. Relatively small blocks and interior streets make for safe and well-used sidewalks.

- **Open Space**
  Open and activated space is an integral feature with the inclusion of mini-parks and plazas, green/sustainable streets and other small public spaces ~ including green rooftops. The

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open space plan for the Meadowview Station is connected directly to the parks approved for the Hampton Station development and creates a substantial band of open space between Station Drive and the neighborhoods to the west.

- **Integrated**
  The concept acknowledges and is integrated with the entitled Hampton Station development to the north, including Station Drive. A new north-south street will parallel Tisdale Way and will provide a second access to the Meadowview Station area.

- **Flexibility**
  Area-specific intensities are flexible so long as the overall development yields remain constant in order to maintain the integrity of the infrastructure estimates provided.

Achieving a TOD-friendly development in a manner consistent with the long-term vision of the community and the city of Sacramento and this plan is the ultimate goal.

THE MEADOWVIEW ROAD STATION TODAY

The Meadowview Station is surrounded by stable single-family residential neighborhoods to the east, west and south, including a large neighborhood of mobile homes east of the Sacramento Regional Transit (RT) rail alignment. The station area therefore has a large existing residential population. There is also substantial vacant land between the RT station and the neighborhoods to the west. More than one-third of the residential population in the station area is under the age of 18; 82% of all households within one-quarter mile of the station are family households, whereas 63% of households on the South Line corridor are family households. The income level of families in the neighborhoods around the Meadowview Station is higher than most of the neighborhoods adjacent to the other stations along the South Line.

The station area is under-served by major retail outlets and services. This deficiency is greatest for grocery stores currently – and resolving this deficiency was a common theme in responses from residents to the community survey conducted as part of this project. According to the economic study conducted for the Transit for Livable Communiities (TLC) project, and updated and revised for this TOD plan, the area is also job deficient.

The Meadowview Community is served by the Pannell Community Center, which provides meeting space and recreation for the neighborhood as well as the South Sacramento population with patrons arriving primarily by car and shuttle bus. While a significant asset to the community, the Pannell Center does not eliminate the need for park space, tot-lots and facilities for seniors and other residents that are within walking distance of their Meadowview Station neighborhood homes.

The LRT station platform, bus facility and surface parking occupy roughly 16 acres of RT-owned land at this station. There are four vacant acres north of the station, some of which have been used for a storm water detention basin; also in RT ownership. The Meadowview Station currently provides 600 parking spaces for LRT users. It is presently the terminal station of the South Line, and about 400 spaces are occupied on an average day attracting over 5,000 users on an "average day".

The 2002 Transit for Livable Communities (TLC) plan proposed 1,230 new dwelling units at the Meadowview Station. Substantial increases in transit boardings were predicated upon this substantial increase in the number of homes within walking distance from the station. The TLC plans proposed loft housing over major retail southwest of the transit station and community retail and offices on Meadowview Road west of Tisdale.

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BACKGROUND

The land to the northwest of the RT property is being developed as a small lot single family development called Hampton Station, which will add 155 new families to the Meadowview Station area. Hampton Station is an indication that there is a market for residential development in the station area. The Hampton Station development plan has been incorporated into the Meadowview TOD concept, including its proposed parks and open spaces along with the internal streets that link the development to Meadowview Road.

Figure 2 Existing Land Use

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GETTING TO KNOW THE COMMUNITY

Two major community meetings were held during the course of the planning process. The first was a workshop, 'piggybacked' on the Farmers Market held on October 3, 2004 at the Florin Road site. The second was a meeting of community representatives at the Area 2 Planning Meeting on July 16 of 2005.

The Workshop

The workshops were well attended and productive. Over 100 attendees participated at the first meeting. After reviewing the presentation materials and discussing the project with City staff and members of the consultant team, most of the attendees filled out a fact-finding and opinion-seeking questionnaire. The respondents offered strong support for the TOD process, and offered many specific recommendations for the development program, which have been considered during this subsequent planning process.

Key points in the response of attendees:

Family Oriented -

- Ensure that this is a neighborhood that serves families.

Seniors -

- Provide for seniors and empty nesters' who have specific residential requirements, and need recreation, shopping and care-giving nearby.

Area 2 Leadership Group Meeting

The Area 2 Planning Meeting was held to present draft plans and discuss direction. At the meeting the assembled stakeholders commented, generally favorably, about the emerging development concepts.

Encroachment -

- The greatest concern expressed was that the interface between new development and existing single family neighborhoods must be carefully managed using height limits and buffers of open space to prevent loss of privacy and encourage the continued use of gardens.

Traffic -

- Increased traffic on Meadowview Road, and the potential diversion of trips to streets in existing neighborhoods, was also an issue.

TRANSPORTATION FOR LIVABLE COMMUNITIES (TLC) 2002

The Sacramento Area Council of Governments (SACOG) in collaboration with RT, did a study of the potential land use impacts of developing around existing and planned stations which included the Meadowview Road Station. The intent of the study was to show that SACOG's forecasted regional development could and should be focused where access to Regional Transit was available, and to show how the property owned by the transit district could be used as a catalyst for focused land use investment. The TLC process included interactive community meetings, and the final report showed how much mixed use, transit oriented development could be supported at each site. The land use presumption of the TLC study is that a substantial percentage of forecast growth should be allocated to TOD at transit and rail stations.

TLC Market Study—Updated

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With high ridership, a large surrounding population base, and solid auto counts on Meadowview Road, there may be opportunities to identify transit-oriented retail that would be beneficial at this site; however, the lack of a strong daytime (i.e., employee) population base in this area will be a limitation. Due to its accessibility to Meadowview Road and growing expenditure leakage in certain convenience retail and services categories, this location may also be attractive for general neighborhood retail development. Depending on its orientation to Meadowview Road, planned new residential development to the south of the station may bring additional residential market support for convenience retail and services located at or near the station.

Although the large vacant property to the west of the RT property may have environmental limitations, in its current state it is underutilized. This has become more apparent now that the light rail station is in service. Given the established land use pattern on surrounding properties, the natural use for this large site is market-rate housing that could target middle-income families like those who live in the area at present. Another potential market segment to be targeted at this site is housing for seniors. Neighborhood-serving commercial and/or community services might also be included in such a development. The benefits of development at this site would likely be maximized if its ultimate development is coordinated with the development of the RT property so that access and synergies between the two properties are maximized.

TLC Land Use Allocations

The TLC Study projected 1,230 new residential units and 1,820 new employees (including over 300,000 SF of commercial space) in the TLC study area around the Meadowview Station. The Meadowview Concept Plan envisions up to 780 dwelling units, and 70,000 to 100, 000 square feet of retail/commercial space including some neighborhood-serving office added to the mix. The Concept Plan identifies a site suitable for a neighborhood market, near Meadowview Road, that could also incorporate residential (possibly live work apartments) above. While not as ambitious in number and density as the TLC recommendations, this mix is transit-oriented with moderately high densities while responding to the community concerns regarding "too much" development.

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The map and notes on the following page summarize the TLC findings. It is interesting to note that the development prototypes shown are three stories or lower. In this TOD study, which recommends the addition of fewer units overall, the development prototypes are very similar, if not somewhat denser than shown in the TLC but the overall numbers of units is much lower. One reason is that the current plan includes nearly 4 acres of required parkland featuring plazas, greenways and other spaces that will reduce the gross density of development, but was not accounted for in the TLC study.

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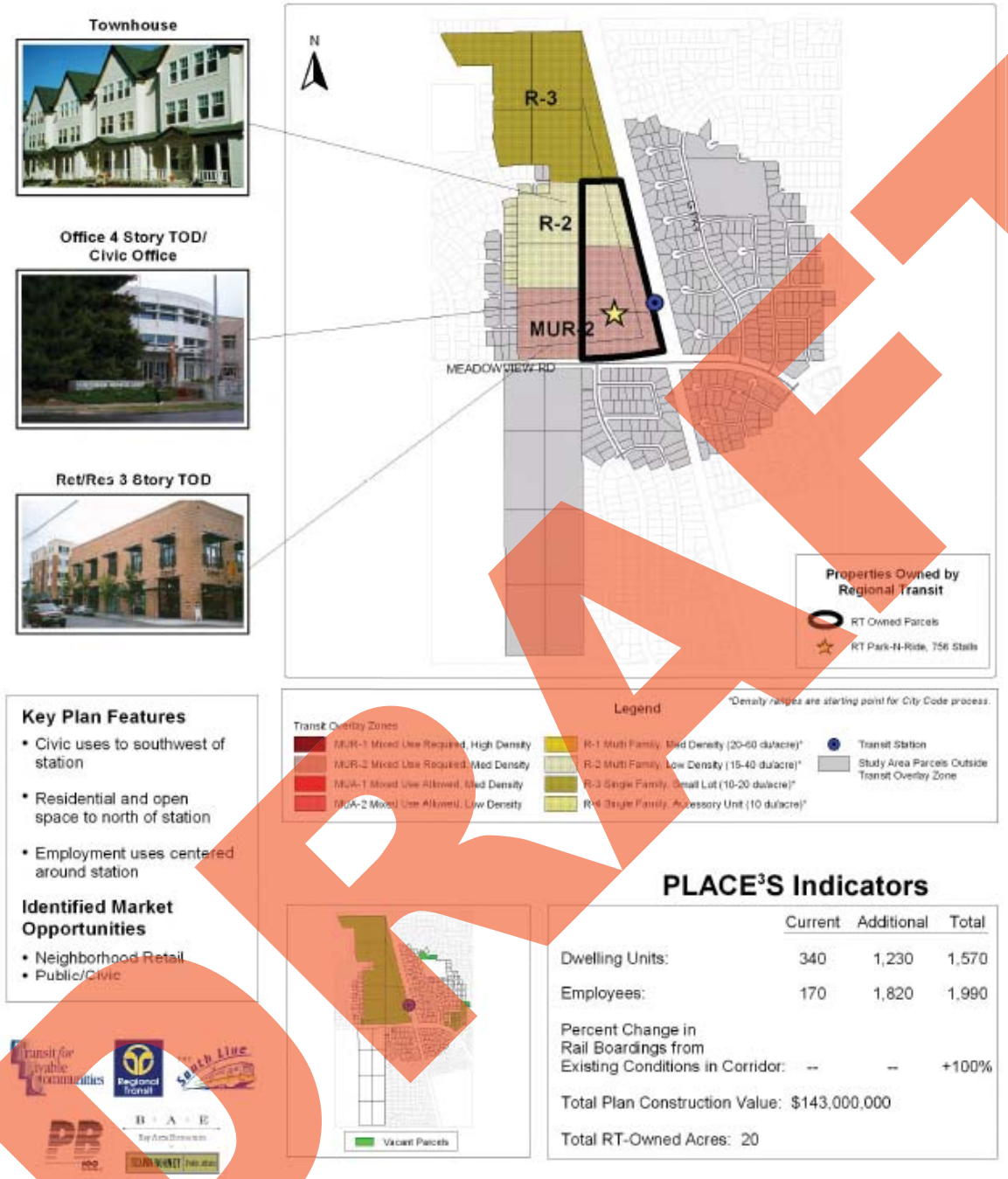

Figure 3 TLC Summary Plan

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OPPORTUNITIES AND CONSTRAINTS

The consultant team worked with City staff to survey and summarize the opportunities represented by existing conditions, RT objectives and community input.

- There are over 30 acres of vacant or underutilized land within a five minute walk of the Meadowview RT station.
- Sacramento Regional Transit (RT) owns 20 acres of land at the Meadowview Station, and has built 600 parking spaces on 16 acres leaving approximately four (4) acres undeveloped west of Station Drive and at the north end of the property, which is also occupied by a stormwater detention basin. Of these, about eight (8) vacant acres west of Station Drive have been identified as surplus property potentially to develop in "transit oriented development" fashion as a mixed use residential and commercial development. The property owned by RT and other vacant and underutilized properties within walking distance of the RT station represent a prime opportunity for well-planned Transit Oriented Development (TOD).
- While the RT site is presently dedicated to surface parking, it is assumed in this Meadowview Station Concept Plan, that the entire site footprint will ultimately be developed and that sufficient RT parking would be housed in a multl-level parking structure, immediately west of the existing light rail station. The future demand for parking at the Meadowview Station, after the South Line is extended to Cosumnes River College will decrease from its present average of 414 occupied spaces on an average week day to closer to the number of spaces now occupied on an average weekday at the nearby Florin Road Station (approximately 130).
- The development of the Hampton Station project, north of the RT property, is a significant incentive for other residential development to occur. The Hampton Station entitlements from the City of Sacramento indicate that there may be a second phase of development on the west side of Tisdale along Station Drive. This area of potential development area is included in the proposed Meadowview Station Concept Plan.
- The new Meadowview Station neighborhood must be designed to be compatible with its existing neighbors.
- The rail transit line to the east and Meadowview Road to the south form distinct boundaries and provide opportunities for more intense, mixed use development.
- The Meadowview Station area is large enough to allow for medium to high density development that is carefully tapered down in mass and height to mesh well with the surrounding neighborhoods.
- There is a potential market for more new residential development that accommodates families, young singles, and seniors who are employed in the region, served by RT, and/or can benefit from transit access to health care, education, and recreation opportunities throughout the region.
- Residential and commercial development at the station must be designed to provide for small families and single person households and retail or civic activities that will benefit from proximity to the very active environment around the transit station.
- Development at TOD-oriented densities along the Meadowview Road frontage should include the potential for ground level retail, services and restaurants. Traffic volumes on Meadowview Road support the viability for these land uses, but also creates the need to

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consider how to reduce the impact of traffic and noise in the new development through frontage development/screening.

- Public open space is an integral part of the development plan. The parks in the plan have been scaled to relate to the needs of residents in a pedestrian-oriented mixed-use TOD development. This open space need and proposed level of development conforms to the City of Sacramento requirements for 'Small Public Spaces.' To accommodate the City's requirements, this proposed plan must incorporate 2.5 acres for every 1,000 new residents on site. Public open spaces such as plazas, green roofs, and pedestrian-oriented 'greenways' add easily accessible outdoor play space, venues for civic and other public gatherings, and well landscaped and shade places to relax on hot summer evenings. Thus, these spaces are eligible components to help meet the requirements.
- Since the Hampton Station development includes a substantial park, the park designed for the Concept Plan neighborhood is linked to it and extended south to create a unified open space which can be programmed for active sports as well as quiet recreation.
- Parking ratios for residential and commercial development meet the minimum Sacramento requirements. Parking spaces are located either at-grade or tucked under and covered. Consideration should also be given to parking located on pedestrian alleys lining the interior of residential blocks. Below-grade parking is not deemed necessary or warranted at this time for this station area.
- Tisdale Avenue, Station Drive and Detroit Avenue, south of Meadowview Road, will provide signalized vehicular and pedestrian entry to the Meadowview Road development. These intersections need to be designed as complete streets so that they facilitate a safe entry point for pedestrians, automobiles and bicycles.
- Transit patronage will grow commensurate with the addition of mixed-use neighborhoods within walking distance of the Meadowview Station. This project site is precisely the type of transit oriented development (TOD) opportunity that can be successfully capitalized upon.
- Implementation of the Meadowview Station Concept Plan will likely be phased in over time. The property owned by RT and other vacant and underutilized properties within walking distance of the RT station represent a prime opportunity for well-planned Transit Oriented Development -- but they need to be developed incrementally to accommodate varied markets and carefully planned growth. Careful attention to on-going parking demands as the South Line Corridor extends will also help dictate the phasing of development by freeing up "excess" parking spaces.

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Figure 4 View of Meadowview Station Platform

DEVELOPMENT OBJECTIVES

The Development Program and Concept Plan for the Meadowview Station area follow goals and objectives that were set by the community and the elected representative(s) serving this area along with the City's *Smart Growth Principles* which recommend that the following objectives be included in future transit-oriented development plans:

1. Support land use, transportation management, infrastructure and environmental planning programs that reduce vehicle emissions and improve air quality;
2. Provide a variety of transportation choices for people to bike, walk, take transit or drive;
3. Promote distinctive, attractive communities with a strong sense of place; and
4. Promote mixed-use development and city centers.

These principles have been included in the following development objectives for the Meadowview Station Concept Plan.

- **Long Range Point of View**

  This Concept Plan is the product of an extensive and interactive process. It recommends a level of development that will relate to the existing scale of this neighborhood but at the same time, offers options for higher intensity development that may be more compatible with improved transit patronage and the aspirations of the next generation of local residents and elected officials. In addition, this plan responds to a large land area, some of it owned by RT, some by single land holders and some small site infill opportunities. Hence, the development will be phased, and as it is implemented, will respond to emerging markets and community preferences.

- **Responding to Neighborhood Concerns**

  The scale of development has been calibrated to relate to local residents' concerns about "excessive" density and height. The plan is scaled back from the TLC plan. Townhouses and

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flats, no more than three stories high are shown at the boundary between the station area and the single family neighborhoods to the west. The potential also exists to build two story townhouses with no second unit at the ground level.

- **Residential Diversity**

  Neighborhood residents have expressed a need for restaurants, coffee houses and places where young and elderly members of the family could spend time recreating on-site. The Concept Plan is responsive to these requests for public spaces, parks and family recreation. The idea of living in a 'transit village' drew a positive response from many of the residents who responded to the survey administered at the community outreach meeting(s), and the transit station is the central focus of the Meadowview Station Concept Plan.

- **Environmental Justice**

  The Concept Plan considers opportunities for local services that are accessible to individuals of all ages and families. The Concept Plan enhances the accessibility of the RT Station for pedestrians and cyclists by providing direct and linked access internally, while maintaining vehicular and transit access. The diverse population envisioned to reside in this area will be able to use transit and enjoy the economic benefit of living near the LRT Station. The benefits include enhanced transportation to destinations throughout the Sacramento region, as well as access to transit-adjacent businesses and services.

- **Build New Neighborhoods**

  The Meadowview Station Concept Plan establishes four residential sub areas. Each has a specific density and a 'main street' that provides an identifiable access to the houses and apartments along it. The densities of housing vary to relate to the boundary conditions that prevail in the subarea.

- **Incorporate Diverse Types of Residences**

  The Concept Plan provides residential options responsive to anticipated local markets, including housing and neighborhood facilities for families, seniors, and singles, in for-sale and rental apartments, townhouse and condominium-type units, as well as small lot single-family residential units.

- **Include Neighborhood-Serving Commercial Uses**

  Include Neighborhood-Serving Commercial Uses: Local-serving retail is included in the new neighborhoods, within a robust and pleasant pedestrian environment. As development occurs around and on the station property, the market for new retail, particularly a major grocery store that is high on the community's list of priorities, and community-serving offices will occur as well.

- **Provide Neighborhood Open Space**

  Following the intent of the City of Sacramento's Ordinance 2004-63, the plan meets, and actually exceeds, the neighborhood park dedication standard required on site by all new residential projects. The scale of the open space is intended to serve the daily needs of the residents for active and passive recreation. The Meadowview Station Concept Plan also includes a network of 'greenways' that are designed as both pedestrian links to the central area, parks and the transit station – as well as for adjacent strolling and play areas for residents. The development guidelines also encourage the inclusion of 'green roofs' that are publicly accessible, or possibly dedicated for private gardens for individual dwelling units to provide additional open space opportunities for residents to relax, garden, etc.

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- **Provide Small Public Places**

  The City's Small Public Places policy as well as the Parks Master Plan recognizes the importance of small public spaces ranging from 0.5 acres down to 1/18 of an acre in size. Development guidelines for the Meadowview Station Concept Plan urge the inclusion of such spaces throughout the project area. These spaces range from "tot lots" to senior gathering areas, and include a 'public market' along the east edge of the plan area.

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CONTEXT

The plan diagram below shows the urban context of the Meadowview Station planning area. The Concept Plan area is surrounded by diverse single family neighborhoods. It is well-served by small parks, an elementary school, and the Pannell Community Center, which is a few blocks west at 24th and Meadowview Road. The Hampton Station development was recently approved, consisting of 19 acres of developed land and 155 homes including several acres of new park land north of the Meadowview Station plan area. The open space provided by the Hampton Station development will serve the neighborhood recreational needs of community residents of all ages.

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Figure 5 RT Owned Property

Meadowview Road is a major four-lane east-west arterial with an average daily traffic (ADT) volume in excess of 35,000 vehicles per day. The principal points of access to the plan area from the south (Meadowview Road) is at Tisdale Way and Station Drive. No access is provided from the east as the RT mainline and UPRR mainline serve as a barrier. From the west, the principal access is provided from Loma Verde Way (on the north), Trentwood Way and Ellwood Way. From the north, access is limited to the Hampton Station development roadways (i.e., Station Drive).

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LAND USE CONCEPT

RT Property

The program for development of the 20 acres of RT owned land primarily dedicated to the following land uses:

- Approximately four (4) acres at the station are proposed to be re-developed with mixed-use development integrated with a proposed RT parking structure that would replace up to 400 of the 600 surface parking spaces utilized today (based upon the existing peak utilization figures). This number of spaces could be reduced as the station transitions from a "terminal station" to a "line station" with the South Corridor extension.
- Civic or retail uses for the community at the foot of the parking structure.
- Residential and commercial uses would be developed immediately adjacent to and/or over the station/parking..
- Open spaces/greenways that connect the various neighborhoods by direct, non-motorized pathways to the Station area.
- The existing bus intermodal connection (bus/rail transfer), supplemented by kiss & ride spaces in the immediate vicinity of the station. These spaces could eventually be combined with the structured parking proposed for the retail center at the Meadowview Station further enhancing the "shared-use" nature of the parking, while encouraging transit ridership and reducing overall traffic volumes at the project site.

Contiguous Properties

On the properties not owned by RT but within 1/4 mile of the station, the proposed development programmatic content is similar in the sense of mixed-use retail and residential. While the parcels are largely vacant today, future development will need to be sensitive of the need to blend into the surrounding neighborhoods. Station Drive, the access street to the Hampton Station development, has been incorporated into the proposed TOD plan, reflecting the fact that there are prior entitlements that will ultimately be used to develop the area west of RT's property.

Open Space

The plan features an extension of the larger park which is being developed as part of the Hampton Station development to the north. The parks are situated at the north end of this new TOD neighborhood and are large enough to accommodate small soccer fields, playgrounds and passive recreation.

The Greenway

The parks are connected to the rest of the community by a 'greenway' six hundred and fifty feet long and approximately 50 feet wide. The greenway has park-like landscape features, decorative paving and pedestrian lighting and is envisioned as a recreational/access facility for peds and bikes connecting parks, residences and neighborhoods within the Concept Plan area. As this green, pedestrian street crosses the central east-west axis of the RT station, a pedestrian plaza marks the event, and a similar pedestrian environment extends in both directions, toward the civic or commercial base of the structure nearest the RT station, as well as toward the western neighborhoods along 32nd Street. Maintenance of these "Greenways" should fall to the developer of the project through a PUD or other form of landscaping funding mechanism.

Neighborhood and Community Retail/Commercial

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The Concept Plan identifies a site on Meadowview Road, east of Tisdale Way that would accommodate a variety of commercial retail opportunities. This site is large enough to accommodate up to 70,000 square feet of retail, which would accommodate substantial supermarket at-grade, with structured parking above it, and (potentially) a green roof capping the structure. The small-retail program would be smaller as there could be some community serving uses or offices included as well as residential at-grade or above the commercial development. These retail components are a major aspect of the land use concept, responsive both to community wishes and to finding the right programmatic mix for a highly pedestrian-oriented TOD development.

NEIGHBORHOODS AND SUB-NEIGHBORHOODS

The character of the community around the Meadowview station should be shaped by a number of interactive factors. These factors should be taken into account as the development plans are considered and refined and some the market is more precisely defined. The issues affecting the plan include:

- Proximity to RT station
- Access to parks and open space both existing and planned
- Proximity to Meadowview Road
- Contiguity to surrounding neighborhoods
- Desirable residential density
- Anticipated household size and family types

There are two unique attributes of the planned Meadowview area that also have specific impacts on the potential to shape neighborhoods. The first is the Hampton Station development at the north end of the station area that will provide 155 single family residential units and a substantial amount of public park area. The second is the community serving market that was planned as a result of community feedback. These elements have been given significant consideration. In the case of the Hampton Station, the location of the park and the access road have been taken as givens, and built into the plan. The market has been located north of Meadowview Road, and southwest of the RT station to make it visible and accessible, and to avoid routing traffic through the new residential environment.

As the largest single land holding in the plan area, RT will eventually seek a developer for its property. Market conditions at the time of development as well as RT's specific development objectives will have considerable effect on the ultimate intensity of development and the mix of uses. This Concept Plan will serve as guidance to that process.

Of course it is not possible to predict the nature of the neighborhoods that will be developed. The map and the corresponding subneighborhoods described below are an attempt to show how the factors described above might come to fruition.

Active Family Medium Density Residential (Map Key: C, E, and F)

This area should be a welcoming environment for families with children because of the relatively easy access to the planned parks to the north along the proposed 'greenway' that forms the central feature of the area.

Platform Adjacent Mixed Use (Map Key: B and D)

Transit oriented and ideal for the kind of households that occupy loft housing. This area will be ideal for people who work at home or use transit daily for their daily commute. Both the station

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and the market may have housing over other uses, which could include RT parking as well as ground level civic or commercial uses.

Main Street Mixed Use (Map Key: A)

This sub neighborhood is best suited for empty nesters and individuals seeking a more urban lifestyle either for their residence or their office emphasizing the interaction between home and adjacent commercial opportunites such as cafes, restaurants, cleaners, etc.

Single Family Adjacent Lower Density Residential (Map Key: C and E)

This neighborhood will feature a lower density town house environment that is complementary to existing neighborhoods and provides larger accommodations for families close to the RT station, parks, and shops.

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Figure 6 Neighborhoods and Sub neighborhoods

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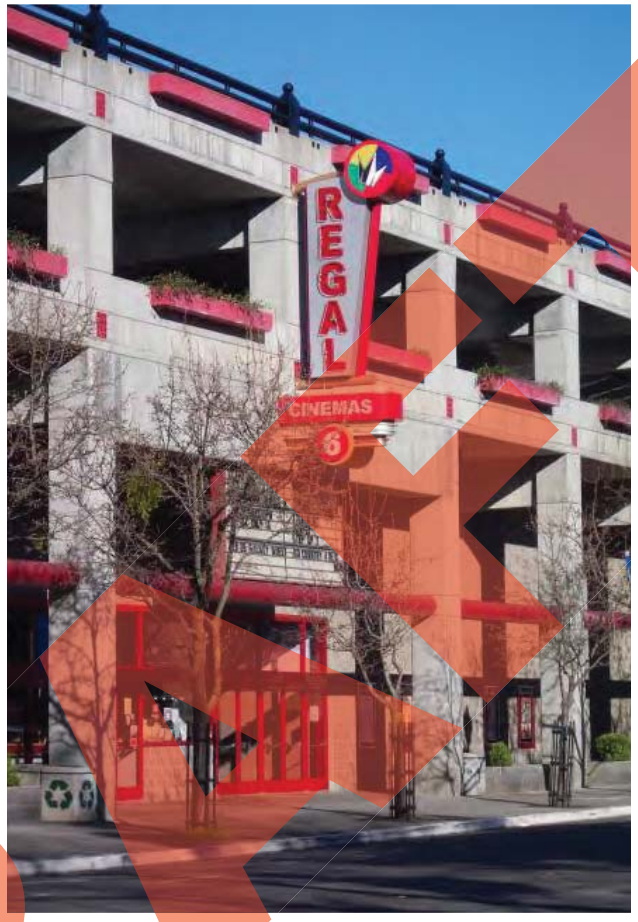
RT TRANSIT OPERATIONS AND PARKING

The whole of RT's property at the Meadowview Station area will ultimately be developed as a TOD, where the pedestrian/transit interface is the dominant form of transit access. Park and ride access will still be accommodated, but RT patronage will increasingly be users walking from nearby residences, on-site employees using transit to get to work, and/or access to the station by RT bus, shuttle bus, and shared rides.



The Concept Plan envisions that the entire site will (ultimately) become a mixed-use neighborhood and that RT surface parking will be reduced in number as the Station transitions from an end-of-the-line "terminal" station to an in-line station.

In the future, parking would be incorporated into a parking structure, adjacent to the existing RT light-rail station. The parking structure in the illustrative plan has the capacity for about 200 spaces. If the parking structure is developed after the South Line is built, accommodations for park and ride patrons could be reduced even further.

The new/future RT parking structure could become a joint development with the private sector, by including air rights for residential and/or commercial land uses. At the ground level, the Concept Plan identifies a civic and commercial uses. The parking structure would also provide some parking spaces for the air rights users, as well as for the civic or commercial uses included under at the ground level. Ideally, all of the spaces in the structure would be shared to conserve space. As such, local residents, commercial venues, and conceivably transit users could participate on a time-share basis, reducing the overall demand for "permanent" parking. One concept is to build and market the parking as a utility function and not as part of the typical purchase of residential or leasing of commercial property. Conformity with existing zoning requirements would obviously have to taken into consideration.

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Figure 7 Grocery with Parking and Housing Above

VEHICULAR CIRCULATION

This TOD plan is based upon an assessment of the capacity of existing transportation and utility networks. The traffic analysis notes the need to modify the signal phasing at the Station Drive entrance to the site to accommodate an increase in peak hour traffic anticipated by the land uses proposed in this plan.

The present 35,000 ADT is projected to increase to 47,000 ADT by 2025. This increase in traffic will affect turning access into the site and will reduce the feasibility of left-turns in and out of the new Station Drive. More-detailed traffic engineering analysis will be necessary at the time of development application will help determine the optimum strategy for responding to this reduction in left-turn feasibility.

The traffic study notes that there are Class II bike lanes and pedestrian sidewalks on both sides of Meadowview Road, with appropriate signage and striping. The quality of these resources and, in particular, provisions for pedestrian safety, should be evaluated as new development occurs. As there will be larger volumes of pedestrian traffic crossing Meadowview Road in the future with new development, this may require improved safety devices.

The plan adds a network of streets on the Meadowview Station site that are designed to serve the emerging mixed-use neighborhoods. The new street and pedestrian network will divide the site area into blocks that are suited for moderately dense neighborhoods and make it desirable and attractive to walk to school, shopping, recreation and to the light rail station. This is reinforced by providing opportunities for these activities within the Concept Plan area and by recommending residential development at a density that will support such activities and land uses.

There are presently five bus routes that stop at the Meadowview Station accounting for 85 daily bus trips. This transit connection provides access to the communities nearby and, as such, is an important transit link and source of transit patronage for the LRT. The Meadowview Station traffic study notes that when the South Line is built, some of the RT bus routes may be re-routed to terminate at the new Cosumnes College Station – thus reducing to some extent the level of transit connectivity. Nevertheless, the station access road has been designed as the future bus access road, as well as the route of choice for shuttle buses and other traffic bound for the station.

The following figure illustrates the five types of "streets" that would be developed as part of the Concept Plan for the Meadowview Station. Cross-sections of each street concept follow this figure. A brief description of each street type is noted below:

- **Section A:** This illustrates a typical four-lane street with on-street parking, a median and relatively wide planter areas/ped area on the sides. This is the main street serving the Meadowview Station site.
- **Section B:** This street type would access the parking garage discussed previously and consists of a mixture of one or two lanes with on-street parking and class II bike lanes.
- **Section C:** This is the typical "Neighborhood Street". comprised of one-lane in each direction and generous planter strips for tree shading.
- **Section D:** "Park Neighborhood Streets" are one-lane in each direction with on-street parking and class II bike lanes.
- **Section E:** This is a typical "greenway" that is not intended for vehicular traffic. It serves as both a unifying element for the development as well as providing both a pathway and recreation space for the residents of the area. The greenways would allow for emergency vehicle and maintenance access. Maintenance of these greenways should be carefully

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determined prior to development to establish the appropriate stewardship and ensure long-term viability.

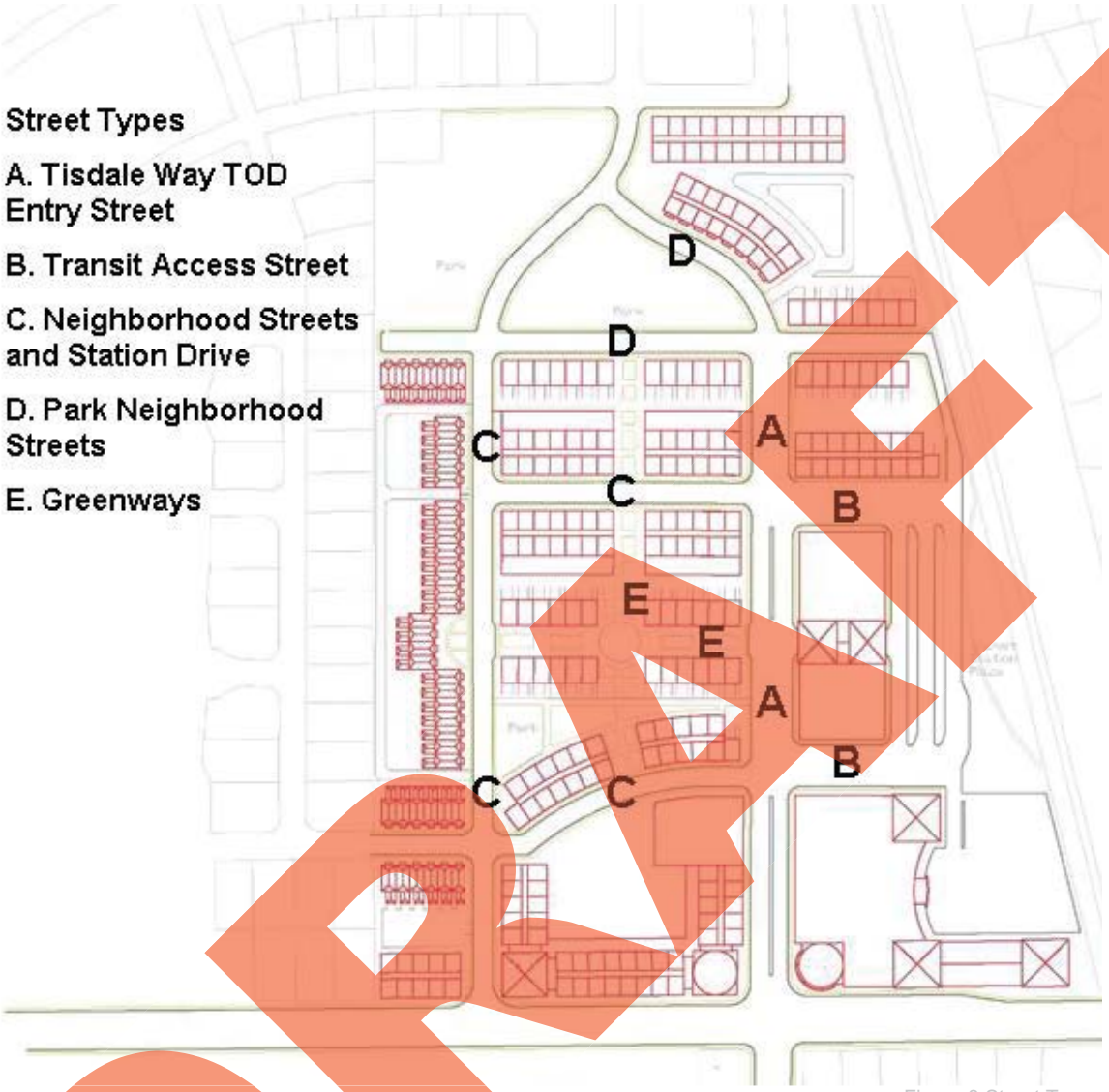

Figure 8 Street Types

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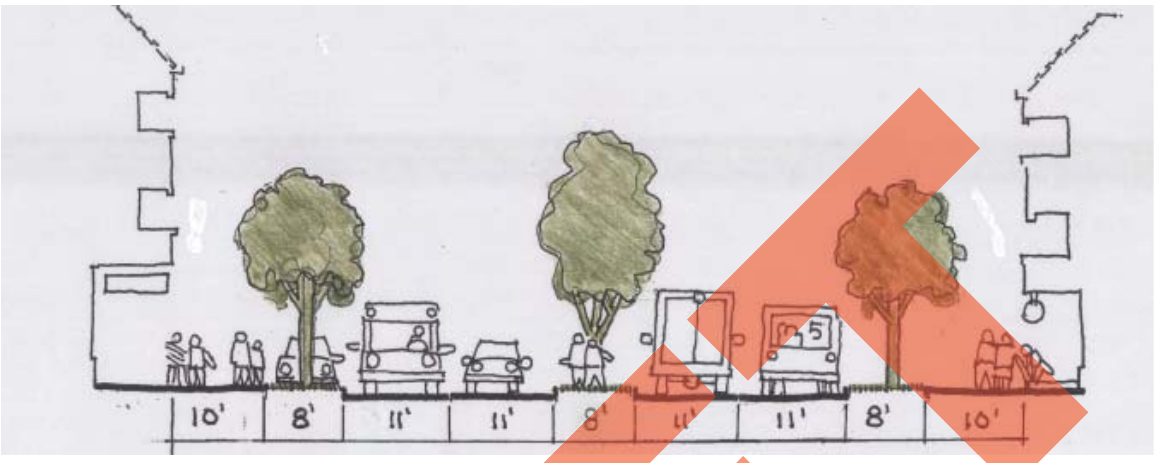

Figure 9 Section A - Tisdale Way Access from Meadowview Road

Figure 10 Section B - Transit/Park and Ride Garage/Intermodal Access Street

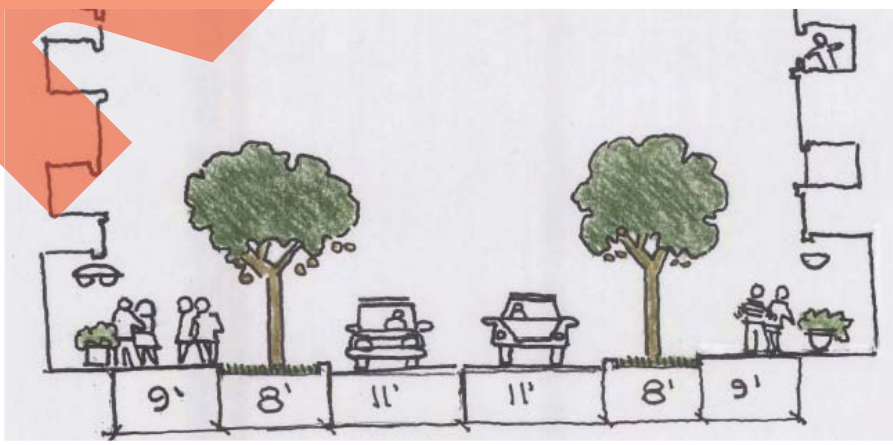

Figure 11 Section C - Neighborhood Street

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Figure 12 Section D - Park Neighborhood Street

Figure 13 Section E - Greenway

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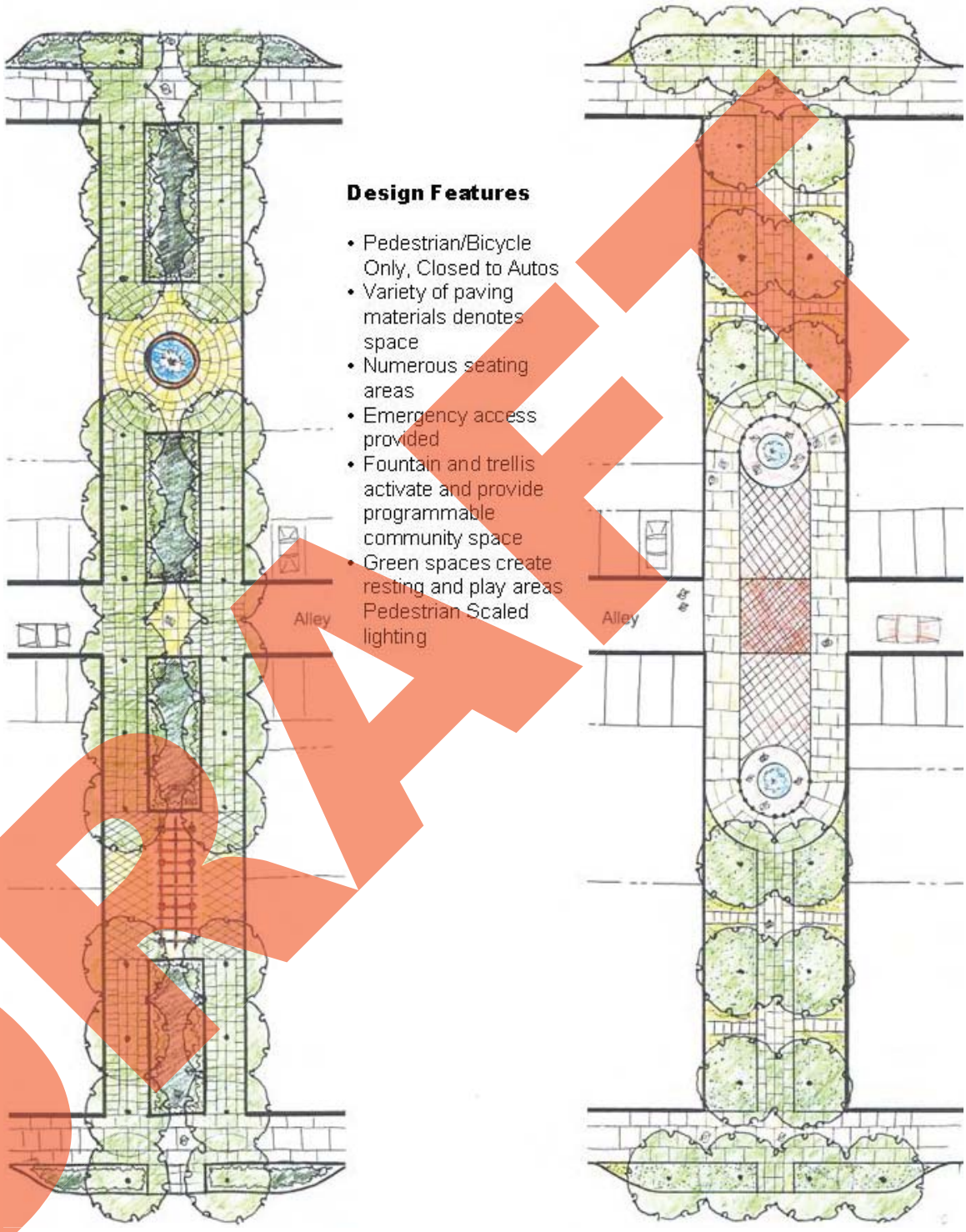

Design Features

- Pedestrian/Bicycle Only, Closed to Autos
- Variety of paving materials denotes space
- Numerous seating areas
- Emergency access provided
- Fountain and trellis activate and provide programmable community space
- Green spaces create resting and play areas Pedestrian Scaled lighting

Figure 14 Sample Greenways

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PEDESTRIAN CIRCULATION

An objective of the Concept Plan for the Meadowview Station area is to design every neighborhood to encourage free and safe pedestrian activity. The design of streets, sidewalks and pedestrian crossings must not only ensure the safety of pedestrians, but also encourage pedestrian mobility.

The Concept Plan includes a network of streets which establishes an urban block pattern. The block size varies in size and shape, but the pattern ensures that traffic will move slowly through the area, and pedestrians will be able to cross at intersections with safety and ease. The pedestrian circulation plan also includes 'greenways' that facilitate safe and comfortable movement through the area. These greenways are private ped/bike access ways that would also permit emergency and maintenance access for vehicles when necessary.

This Concept Plan recommends that each greenway crossing with a public street be analyzed and designed to meet the stated objective of "encouraging free and safe pedestrian activity" while maintaining vehicular circulation. There are sections and guidelines as examples included in other sections of this report that illustrate an approach that could be taken to achieve this goal of safety at crossings.

It is noted that Station Drive will be a particularly busy street as it accesses the entire TOD, the parking garage and the Hampton Station development to the north. As such, vehicular access to the RT station will be coupled with traffic headed to the proposed community market, as well as ordinary neighborhood service traffic. In order to mitigate traffic and reduce the hazard to pedestrians, who are the most important tripmaking component of this neighborhood, the following measures are recommended:

- Wide and well-landscaped sidewalks;
- Medians, with pedestrian refuges at intersections;
- Well-marked and well-lit pedestrian crossings—with distinctive pavement changes, elevated surfaces, overhead illumination, and pedestrian signals;
- Bicycle lanes and/or on-street parking to create a buffer between the pedestrians and automobile traffic;
- Corner 'bulb outs' to shorten the pedestrian crossing; and
- A maximum of four travel lanes on any given block to minimize crossing distances for pedestrians.

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GREENWAYS

The concept of 'greenways' has become a standard planning and urban design concept around the world. In the 20th century, it was formally recognized in northern Europe; many specific attributes related to the design of greenways are recommended for inclusion in the Meadowview Station Concept Plan. Maintenance and emergency access can be accommodated but private vehicular traffic would be prohibited. Greenways feature a variety of paving, landscaping, water features, and lighting that emphasize the intimate scale of pedestrian activity, particularly accommodating children and seniors.

In the Meadowview Station Concept Plan, a greenway runs along a north/south axis that extends from the large open space to the north of the pedestrian-oriented community to the southern boundary of the principally residential area. This north/south axis intersects with a greenway that runs along an east/west axis that connects the westerly residential neighborhood to the RT station through the base of the proposed RT mixed-use parking structure. Combined, these 'greenways' link all of the new developments, as well as the existing neighborhoods on the west side of the development site. The greenways are 44-56 feet wide, with a 20'-26' linear active space at the center, and a protected 12'-15' pedestrian walkway on both sides.

The figure below depicts the general location of the greenway concept for the proposed Meadowview Station plan area. The figure on the following page illustrates two "typical" concepts – a more hardscape oriented example and a more greenscape example.

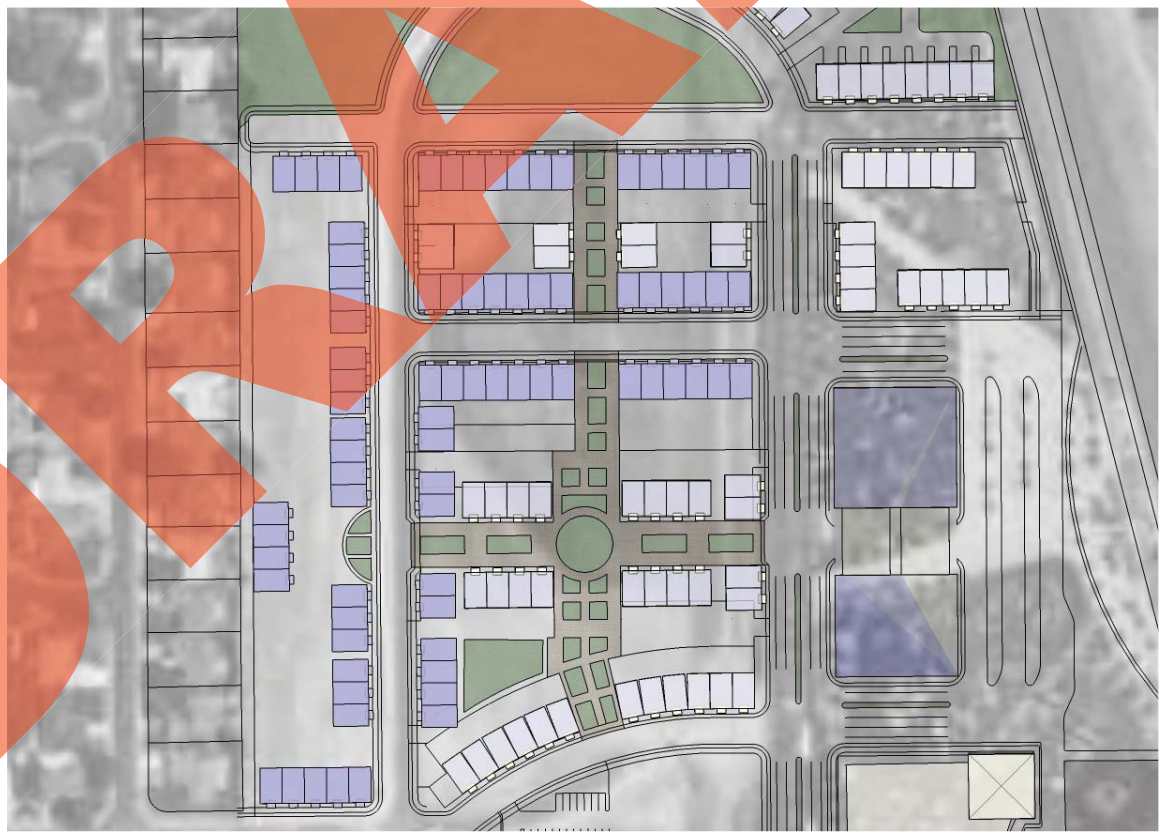

Figure 15 Greenways

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PARKING RECOMMENDATIONS

Parking is provided on-site and at curbside for all residential units except where multi-story units in the vicinity of the RT station and near Meadowview Road justify structured parking. Parking ratios specified meet minimum City of Sacramento standards for transit-oriented residential or commercial development. No subterranean parking is proposed or included in this plan, as the density of development and current land costs do not support that level of investment. Much higher density development and particularly high density mixed-use development along Meadowview Road would be required to justify subterranean parking.

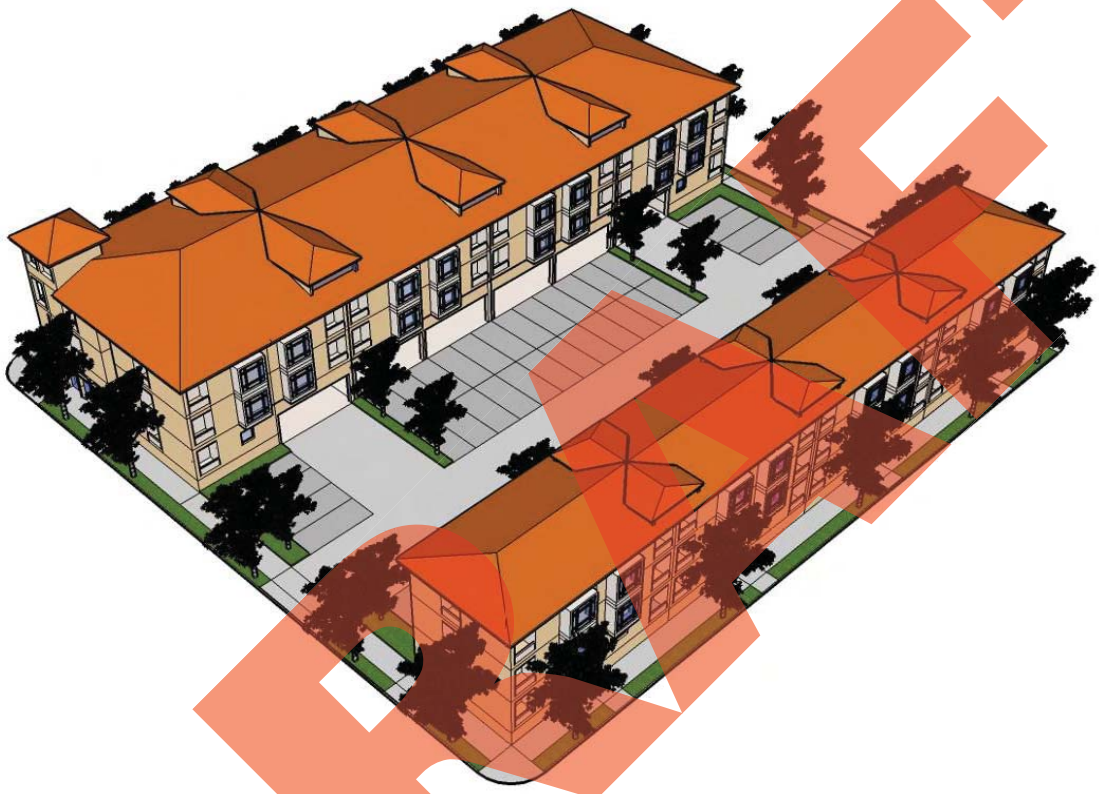

Figure 16 Example of Mid-block Parking

Residential Parking

Figure 16 is an example of a typical double-loaded block with mid-block and curb side parking. Parking spaces in the mid block may be exterior and/or below the rear of apartments/condominiums as in the example above.

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PARKS, OPEN SPACES, COMMUNITY FACILITIES

The City of Sacramento, Department of Parks and Recreation has recently provided guidelines and incentives for "Small Public Spaces for Sacramento" that have been incorporated into the plan for Transit Oriented Development in the Meadowview Station area.

> *"Small Public Places are small neighborhood parks and plazas from 5 acres to 1/18th of an acre in size, located in designated high-density areas and park deficient neighborhoods throughout the City. Small Public Places will be an added component of our City-owned park land, and are intended to provide relief from the hardscape and intensity of City-life serving as positive places to gather and recreate where land is in short supply." (City of Sacramento Department of Parks and Recreation web site. Updated 2/20/08)*

In meeting notes from the Parks and Recreation Commission in May of 2006, the City of Sacramento's goals for Small Public Spaces are made explicit. These notes can be summarized as below:

- Provide for active uses including small dog parks and small sport court areas.
- Include public art
- Farmers markets are a way to attract people to underused spaces
- May be developed in partnership with developers and the community
- City is not reducing its overall 'Quimby' requirements, but staff proposes a goal of 2.5 acres /1000 residents on site and remaining requirements (2.5 acres) to be met other ways.
- In addition to the designated park space in the TOD concept, the linear park spaces (greenways) add space for passive recreation, pedestrian walkways and quiet areas.
- Take advantage of land that is already in the public realm through the joint-use of drainage facilities and corridors designed as greenways.
- Create multiple uses in the public realm, including all scales/sizes
- Tot lots sometimes get more use than open field areas
- Include hardscape in design
- Use Rooftops
- Provide for the recreational needs of teens in site design

The Meadowview Road Station TOD plan includes two larger 'Small Public Places' located at the northern end of the plan area that serve as an extension of the larger parks approved for the Hampton Station area. The street labeled "Station Drive" in this plan approximates the street that has been entitled as a part of the Hampton Station development. The new parks will be surrounded by townhouses and flats in the Concept Plan providing a comfortable buffer for the existing residential development on the west side of 22nd Street. The new parks will provide a center of active play for families and children, as well as a quiet place for seniors. The parks are large enough for sports venues, including soccer and softball, and are especially well-suited for leagues dedicated to younger children.

Interface with Existing Neighborhoods

The aforementioned parks be bordered by townhouses and flats, and possibly by medium density condominiums and rental units on the southern and eastern side. The park is strategically located to act as a buffer between the TOD development around the Meadowview Station and the residential community to the west that lies between Trentwood Way and Loma Verde Way. Linked to the Hampton Station parks, this chain of open spaces will be a recreation center for families and children, and a quiet place for seniors and others. The west edge of the park should be specifically designed to provide a buffer for existing communities, and it should be well illuminated to offset concerns about security and safety related to the park environment.

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Sustainable Park Features: In keeping with City policy, the landscape and paving in the park and in other small urban places should be designed to collect and recycle surface water, and use fountains and pools, if possible to enhance that option.

Active Play Parks

The Meadowview Station TOD plan includes two parks that provide the amount of neighborhood park acreage prescribed by the City Parks and Recreation Department for small public spaces including transit villages (2.5 acres/1000 new inhabitants). This open space requirement acknowledges the importance of density and the ease of pedestrian access to a transit station. The remaining community park acreage should be negotiated with developers to determine the appropriate combination of off-site land dedication and in-lieu fees.

Green Roofs

The plan recognizes the opportunity for green roofs, small public plazas and recommends a continuous network of street landscaping to create an open, park-like environment throughout the neighborhood. The roof of the parking structure should be a 'green roof' and could include active and/or passive recreational features to supplement more traditional open spaces. If the neighborhood/ community market proposed for the TOD area is built, its roof area should also be considered for a public space much like the roof of the RT garage. Acreage for the green roofs has not been included in the calculation of open space provided on the development program.

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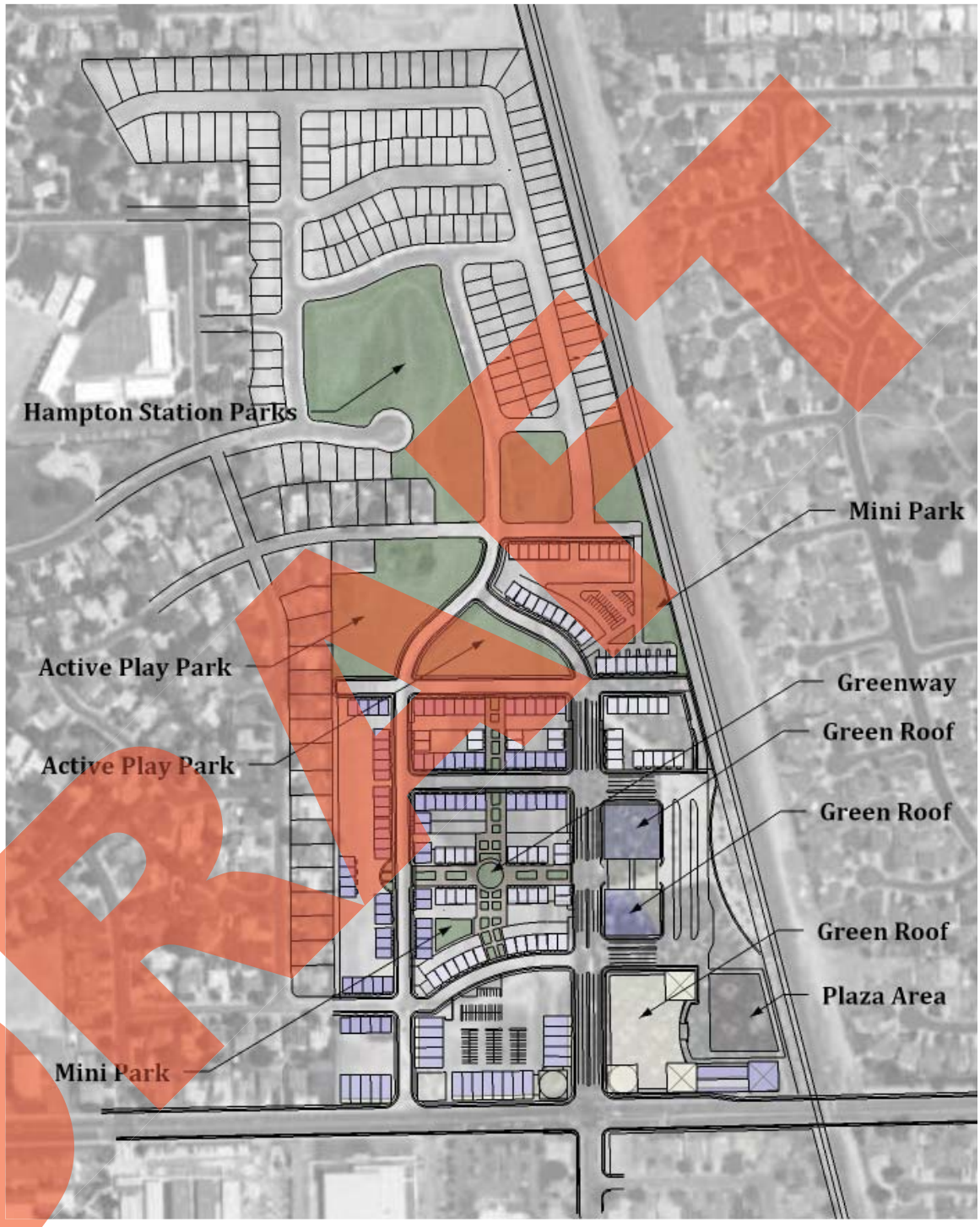

Figure 17 Parks and Open Space

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COMMUNITY FACILITIES

Neighborhood Center

The Sam Pannell Community Center is southwest of the TOD area. At three-quarters of a mile away, the community center is at the upper limit of a comfortable walking distance to/from the Meadowview Station site. The Center provides residents of the area with a full spectrum of community meeting and recreational opportunities. To augment this comprehensive community facility, the Meadowview Station Concept Plan should provide recreational opportunities for a variety of age groups and interests accessible from the neighborhoods and from the transit station.

Figure 18 Samuel Pannell Meadowview Community Center

The street level courtyard that provides access to the transit station is an ideal focus for some of these activity-centered uses. The second level and the green roof of the market/retail buildings are other potential locations. Community facilities may also be placed on the street level or the second level of the mixed use commercial that is proposed along Meadowview Road. The precise nature of the activity should be defined as the development program is refined and the demographics of the population of the Meadowview Station site are better defined.

Figure 19 Public Gatherings

Public Market

Public markets held on a periodic basis have grown in popularity both nationally and locally in recent years. Sites with transit access are particularly to the success of these markets. The Meadowview Station Concept Plan provides a site for such an activity located on the linear plaza that links Meadowview Road with the RT station immediately behind the proposed major grocery store. The market could be an enhancement of the grocery store's marketing, or it could be managed by and for the community by a non-profit entity.

Figure 20 Farmers Markets

Entertainment Venues

This Concept Plan envisions eliminating surface parking for transit at the Meadowview Station site. If a structure is built, it will afford the community a ground level space of about 36,000 square feet that can be used for a large floor plate use such as a fitness center, an ice rink, a

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multiplex cinema, or some other combination of uses that benefit from close proximity to the transit station while providing entertainment options for the residents and transit users

The development framework presented has been planned to accommodate a range of development programs. The infrastructure network, streets and utilities, and the open spaces and public spaces are systems that can accommodate higher densities—to a large extent. The ultimate decisions about the characteristics of the mixed-use transit-oriented residential neighborhood that will be built in the Meadowview Station area will be made by the City of Sacramento (as the land use control entity), Regional Transit (as the major landowner), the residents of nearby neighborhoods (with high interests in a successful outcome), and the developer's judgment about the market that prevails when development actually occurs.

The Illustrative plan below shows the central framework that will, in fact, ensure that any development will be pedestrian-friendly, transit-oriented and will fit into the existing neighborhood context. The illustrative plan shows how the illustrative development program fits into the framework of streets, pedestrian circulation, open space and civic or public spaces. At somewhat higher intensities of development, the same framework will still be functional, and will still provide comparable access and amenities for the community.

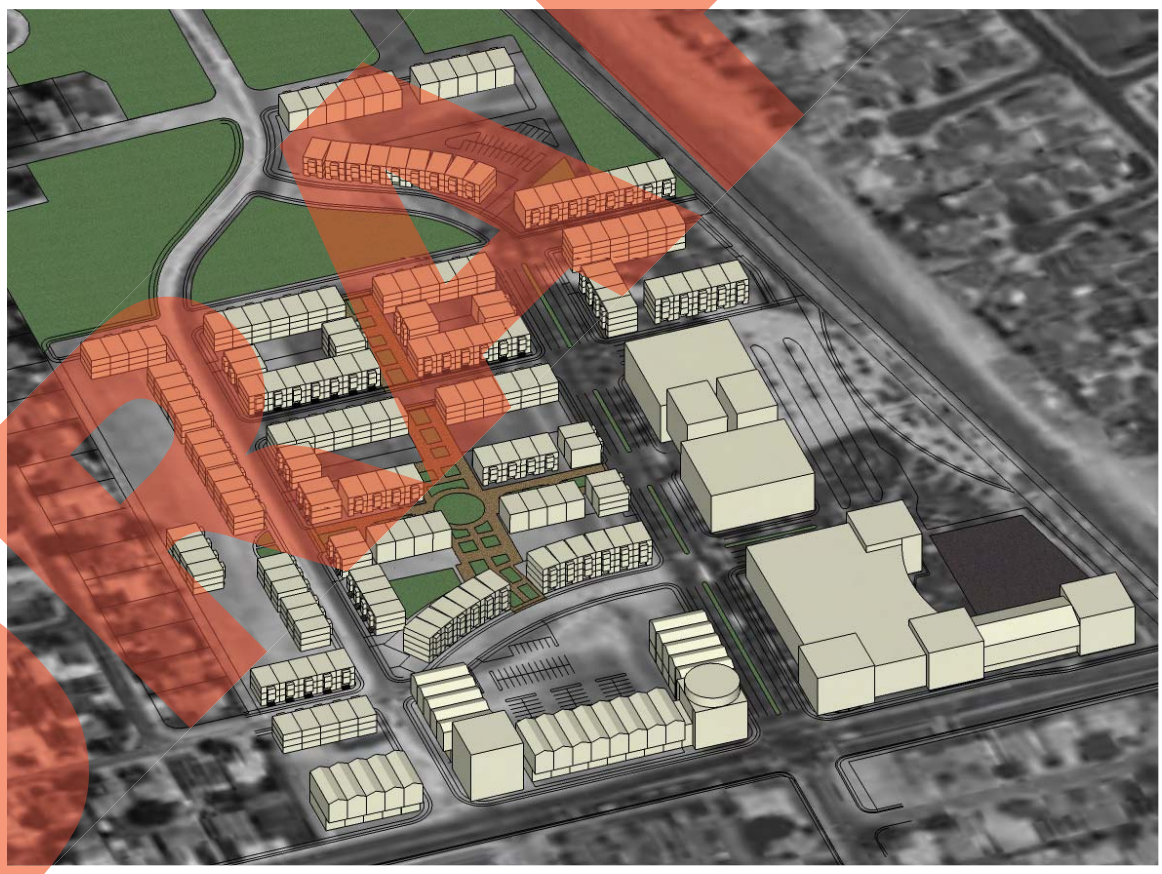

Figure 21 Illustrative Development Framework

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Figure 22 Station Platform Detail

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DWELLING UNITS

The number of dwelling units built on the sites around the Meadowview Station will ultimately be determined by the prevailing market at the time of development, and by discussions between the property owners and the public agencies that have jurisdiction over land use. RT has a special interest in medium to high density residential neighborhoods within walking distance of its station in an attempt to enhance transit ridership. Neighbors and advocates of 'traditional' neighborhoods tend to support small-lot single-family development. The successful plan will need to provide a reasonable level of return and revenue for the developer and to Regional Transit while balancing the needs and desires of the community. The proposed program and the illustrative Concept Plan recommend neighborhood development concepts that meet RT's requirements while responding to the community's expressed desires. The development program is also responsive to prevailing market conditions and to the goals and objectives of the community and the elected officials who represent them.

The program shown in Table 1, Land Use Table, is responsive to currently prevailing market conditions, and to the goals and objectives of the community and the elected officials who represent them. There are two versions of the program in the table.

Base Development Program

The 'Base' program meshes the building types into the fabric of the existing residential neighborhoods in the vicinity of the Meadowview Station. Along Meadowview Road, medium density apartments/condos over (some) retail development is proposed to relate to the roadside environment. On the west, north and east sides of the development area, the Concept Plan and program envisions an integration of lower intensity house types, such as town houses or townhouses with flats. Combined, these housing types will offer housing for families of all types and sizes.

Maximum Development Option

The 'Max' program illustrates the potential for a higher-intensity development program. The max program includes a larger number of medium density apartments/condos within this new neighborhood. The higher-density sites would be located near the transit station providing substantial convenience for transit riders with destinations near other light rail stations in the region. The Max program does not change the intensity of development along the eastern and western edges where the new neighborhood interfaces with existing residential areas.

The base development program includes these distinctive housing types. Prototypes are shown following these descriptions.

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Townhouses over Flats

The two units together create a three story environment with the potential to house extended families or to provide home owners with a rental option, or a single story unit that may be sold as a second condominium.

- The townhouse is the two or three story unit above the street level apartment or condominium.
- It usually contains one to three bedroom apartments or condos.
- Street level apartments have set-back and elevated entries with canopies and/or roof projections.

Medium Density Apartments/Condos

These may be viewed as stacked flats around a single entry, rather than units that are arranged along long corridors. The square footage can be varied, and some apartments may be large enough to accommodate two and three bedrooms.

- Three and four story buildings which may be built as condominiums or rental apartments are a very popular aspect of TOD development.
- There are a variety of ways to achieve medium density residential development and these represent a flexible alternative.
- They can be aligned along the edge of parks, or clustered around mini plazas.
- They represent a good alternative to meet the growing market for 'empty nesters' and young singles or small families.

Medium Density Apartments/Condos over Retail

The Meadowview Station area neighborhood is designed to make shopping a pedestrian friendly activity, station area residents, residents and employees in nearby neighborhoods, and transit riders.. This vertical mix reflects the fact the ground floor retail has often been combined with apartments to create a highly urban mix of activities. The double loaded apartments can extend over covered parking spaces behind the retail and provide additional parking at-grade behind the buildings.

- This is a commercial-residential mixed/use prototype.
- The ground floor commercial is higher (14-24') floor to floor.
- Retail should be set back or arcaded to accommodate the relatively hot Summer climate in Sacramento.

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- Shop windows should occupy most of the ground floor façade.
- Entrances to apartments are near the ends of the block, or in a distinctive tower at the center.

Two to Three Story Apartments/Condominiums over Market

Similar to the Medium Density Apartments/ Condos over Retail prototype, this vertical mix reflects the fact that a market in the Meadowview area is a highly-desirable retail concept. Depending upon the size of the market, these units might be concentrated along the Meadowview Road frontage.

- Ground floor commercial is higher (14'-24') floor to floor
- Retail is set back from property line and/or arcaded
- Large percentage of ground floor façade is shop windows
- May include prominent border such as hedge or low wall at sidewalk
- Mid Block Parking and Pedestrian Circulation
- Units facing Meadowview Road are mixed-use with retail at street level
- Units along interior street may be town houses, apartments or mixed use
- Parking is distributed in the mid block, some at grade below the apartments
- Midblock space may be reserved for 'courtyard' commercial space

One to Two Story Small Lot Single Family Houses

This is the housing type used for the Hampton Station development to the north of the RT station. 155 of these units are included in the plan consistent with the approved development application. A prototype of this category is not provided because additional units beyond those included in the development plan for the Hampton Station are not proposed by this illustrative plan.

Loft Houses

Loft houses are not included in the Meadowview Station Concept Plan illustrative plan. This housing type could become an attractive option for this program if sited near the transit station or over the transit parking. If this were to occur, loft housing could be added to, or substituted for, the medium density houses included in Zone D—the station platform zone. These units are large, two story homes with a very urban character. Loft housing would accommodate singles, couples, and small families, particularly those who work from home. The loft houses may be built around the proposed parking structure with direct access to parking, as well as access to roof gardens and open space on the top of the parking structure. Such a configuration would represent a "mediating element" between the high levels of activity at the transit station and the more family-oriented neighborhoods nearby

The types of dwelling units included in the program, from townhomes to apartments and condominiums, are directly related to achieving an urban and walkable environment. Relative to the neighborhoods around it, the Meadowview station area neighborhood will give more families immediate and comfortable pedestrian access to transit, improving ridership, contributing to a reduction in greenhouse gas generation and congestion. Although this plan does not achieve the densities recommended in the TLC Plan, the plan does provide substantial

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park acreage and the opportunity to devoted land sufficient to provide the supermarket identified by the community as a significant deficiency in the area.

As indicated in the Development Program table, the gross density of residential development for the Base program is about 16 dwelling units per gross acre and is based largely upon meetings with community representatives. The maximum program achieves gross densities of roughly 19 dwelling units per acre enhancing the ability to generate transit ridership. On a net basis, reducing the acreage by 20% to account for circulation and open space, the densities rise to 20 dwelling units per net acrea for the Base program, and 23 units for the Max program, per net acre. All computations exclude the Hampton Station development area, which is an entitled single family neighborhood with a significant open space component.

Figure 23 Dwelling Types

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COMMERCIAL COMPONENTS

Just north of Meadowview Road and east of the station access road, and on the southern border of the RT station, there is a site that could accommodate a mixed use development with a footprint as large as 70,000 square feet. The development of such a facility is contingent on a growing population and the demand it generates at and near the Meadowview Station site

Neighborhood Market

This is a sub-area of south Sacramento that is presently underserved by major grocery chains. The new neighborhoods and residents that will occupy the Meadowview Station Concept Plan will add to the demand for a market while also supplying a workforce pool for such a market, as ell as for other commercial activities and offices that might co-locate here. The TLC market update indicates that a neighborhood market is a desirable program element because Meadowview Road is not lined with big box retail shopping opportunities. The proposed market (Zone B) can range in size, depending upon the tenant chosen and the demand. The retail market floor would be at-grade with parking in a structure on the second, and possibly the third level. The structure also has the potential for a green roof to enhance the open space provided and to cool the roof of the structure.

Any permitted commercial uses must also be responsive to the transit oriented nature of the site. Entrances and connections to the RT station should reflect this, to ensure that it is a potential source of transit patronage. If the RT station includes a parking structure, it must be integrated into the mixed use context of the Transit Oriented Development

Mixed Commercial/Civic/Residential Development

This same site offers an opportunity for a larger development. It could easily hold 150,000 to 350,000 square feet of mixed-use commercial/residential development. If the ground level were a 'supermarket', it would directly respond to the updated market study and to the expressed community preferences. The right development would, however, also include other types of ground floor retail, with shared parking above, and offices or other mixed commercial above that. Another alternative would be residential apartments above the stores and the shared parking layer. There are examples of this form of mixed use already built in midtown Sacramento. The allowable size of commercial activity sited here will be directly related to the ratio of parking stipulated for each use, and the degree to which that parking is shared by the tenants.

Neighborhood Serving Mixed-Use Commercial

Along Meadowview Road and in Zone A in particular, the Concept Plan shows retail space at the street level and residential on the levels above. Non-residential uses could include job training centers, senior services, post offices, and/or health or fitness facilities. The transit station area is an ideal location for these uses and activities, since they will be accessible by transit from many neighborhoods in the city. The proximity to the transit station could also attract a future market for a "life-style center" which would involve a single developer and a diverse network of shops designed to attract specialty shoppers from a larger market area.

Retail Space with Residential on Meadowview Road at Station Drive

This is the '100% Corner'. It provides an opportunity for a gateway feature at the main entrance to the new neighborhood. The 'main street' concept should be apparent from store fronts, wide pavements, signs, and shaded sidewalks.

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LAND USE SUMMARY

The following table illustrates what the TOD land-use mix might be in the Meadowview Station Concept Plan. It includes some, but not all, of the mixed use residential prototypes that are introduced above. Specific prototypes are listed and discussed to accommodate future planning at the Meadowview Station. The program is shaped by the Development Framework outlined in the preceding sections of this document.

The net density varies, according to whether the program and the market dictate a 'base level' of development or a higher, 'max' level. Both the gross densities and net densities are somewhat higher than is typical in this area. This is an important and positive way to ensure that the plan is pedestrian friendly ensuring convenient access to transit and a safe and hospitable community.

The density is variable, but the number of families will probably range from 500 to 600, as shown. The open space allocations, which are also shown in the table, are based upon dwelling type specific factors provided for planning purposes by the City of Sacramento, Recreation and Parks Department.

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LAND USE TABLE

MEADOWVIEW STATION PROGRAM									
ZONE	Acres	Residential Units			Non Residential Uses		Open Space Acreage		
		Building Type	Base	Max	Land Use	SqFt	Factor	Demand	Provided
A	4.8	Town Houses over Flats	5	5			0.0075	0.04	
		Flats	5	5			0.0056	0.03	
		Apts/Condos over Retail	74	90	Retail	20,000	0.0044	0.33	
B	4.5	Apts/Condos over Market	18	25	Market	30,000	0.0044	0.08	
					Plaza				
C	7.1	Town Houses over Flats	45	45			0.0075	0.34	
		Flats	45	45			0.0056	0.25	
		Medium Density Apts/Condos	56	70			0.0044	0.25	
					Mini-Parks	8,000			0.18
					Greenways	17,500			0.40
D	4.1	Medium Density Apts/Condos	48	60			0.0044	0.21	
					Retail	22,000			
					Commercial	30,000			
E	7.6	Town Houses over Flats	35	35			0.0075	0.26	
		Flats	35	35			0.0056	0.20	
		Medium Density Apts/Condos	28	35			0.0044	0.12	
					Parks	129,000			2.96
F	5.2	Medium Density Apts/Condos	140	174			0.0044	0.62	
					Parks	16,000			0.37
Total	33.4		534	624				2.72	3.91
Gross DU/Acre			16.0	18.7					
Hampton Station Development									
	28.1	Small Lot SF	155	155			Satisfied through Entitlement		
Total	61.5		689	779					

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Figure 24 Key Map

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PHASING

Identifying an appropriate initial phase is important in any market driven environment, especially when the development pattern must support the continuous operation of an existing light rail station. The principles that guide recommended phasing strategies are set forth in the Summary. (This phasing recommendation is made absent specific knowledge of any projects being considered for approval by the City of Sacramento or any negotiations between RT and qualified developers that may be underway.)

The Phase One concept includes the two zones closest to Meadowview Road (Zones B and D). Phase One could include the development of a market or mixed use development in Zone B. The development would require the development of Station Drive as a major arterial, with a median, wide sidewalks, and a generous landscaping that will symbolize the quality of the new neighborhood to be built. Station Drive would also provide access for RT buses and for the park & ride transit riders that presumably will use the existing 400 parking spaces each day (until the South Line extension is completed). If necessary, the existing demand for surface parking can be accommodated further west in Zones C and E.

New water detention facilities along the Meadowview Road side of the development would be built in Phase One with enough capacity to accommodate buildout of the entire site. The existing detention basin north of the RT station will continue to mitigate run-off during Phase One.

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Figure 25 Conceptual Phase 1

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PLAN OPTIONS

The basic concept illustrated in this plan for the 33 acres of developable land at the Meadowview Station represents the efforts of a multi-disciplined technical team; that effort has been shaped by an extensive dialogue with the community, city staff, and with decision-makers. As with any planning exercise, there are options to the proposed/recommended concept presented herein. Potentially, these options could also enhance residential communities in the area while meeting emerging markets for a mixed use community. As the community evolves and the market changes, other options may arise – but the concept presented herein reflects the "best efforts" of balancing all of the various stakeholders and visions communicated to the technical team at this time.

Developing an overall coherence for the proposed/recommended concept has been the goal. The quality of the pedestrian oriented residential community is equally important and has also been a key driver in the development of this concept. The proposed/recommended character of this concept and plan has been designed with a balance of parks, mobility and parking, and infrastructure (needed improvements in water, sewer, and drainage systems) requirements. As presented in this report, the densities and scale of development of the plan have also been tailored to meet the stated interests of the community and elected officials, as well as the marketplace.

TOD Densities

During the course of this effort, alternative (higher) density concepts have been raised, studied and discussed with the community and policy-makers. There are benefits to higher density and, with RT as the majority owner of property at Meadowview Station and this is a proposed Transit-Oriented Development, higher intensity development (than proposed) would promote more transit use. At the same time, it would also present a challenge to the surrounding community in terms of context, traffic and other effects.

Park and Ride Parking Location

The proposed location of the RT Park & Ride lot adjacent to the existing transit station is a logical feature of this plan. If there were only residential contiguous to the station, and the park and ride facility was located along Meadowview Road (recognizing that there are upper limits to the walk distance most transit users will tolerate) transit patronage would be affected. The affect would depend upon the location of the park & ride lot location.

Parks and Open Space

Parks and open space size and placement have also received considerable attention and been the subject of much discussion. As an outfall of this project and the General Plan Update effort, the City has modified its site requirements (amount and type) for open space in a TOD environment. Much of the required open space is now provided in 'Small Public Spaces' as noted in the plan. However, the parks as proposed still represent a compromise balancing the goal of high density development as close to the transit station as possible with the provision of open space for those residents to use. Some TOD advocates would argue for less open space in exchange for greater development yield and the resulting increased transit benefits this would bring. The current plan makes parks a defining element of the proposed new neighborhood; but at the same time, it crafts the parks as a major element for easy and safe pedestrian circulation to transit, using open space as a conduit for pedestrian traffic.

Mixed Use Development

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The generally accepted "transit equation" favors the inclusion of retail to line the path from home, or a parking facility to the transit station. Retail provides interest to the passerby and helps to animate these paths. Yet, mixed-use commercial facilities near transit stations also reduce residential density in close proximity to the station. Of course, it is acknowledged that higher density residential in major transit oriented centers across the nation often include ground floor retail. Many areas also include platform-adjacent retail that relies heavily upon the transit users for their business – and this can be a rather unpredictable market. This plan does not preclude mixed use, and it acknowledges that more housing near the transit station can be included if the market and the developer are committed to that alternative.

RT Parking Location and Development Alternatives

Regional Transit will have significant control over the ultimate development, because it owns 22 of the 56 acres in the TOD area. The ultimate development of the Meadowview Road properties will be responsive to the largest property owner's requirements, but will also balance the residential preferences of the community and traffic, infrastructure and open space in the new neighborhood.

There are two basic alternatives that could be implemented to increase intensity of development in the area around the transit station.

Alternative Development Intensity for the Structured Parking Lot

Development over the transit parking structure could be substantially increased in density recognizing that the site is the best place to add units and parking with the least negative impact on the surrounding neighborhoods. RT has expressed a desire to retain the existing number of parking spaces, which would call for a substantial structure that could benefit from having additional uses incorporated to provide added activity and security by providing "eyes on the station."

Alternative Development Site for the Community Serving Market

Rather than provide the community serving market identified in the development program in Zone B, this same property could be developed as higher density residential with mixed use potential given the close proximity to the station platform. The market could be shifted west across Tisdale to Zone A. This shift could significantly increase the residential density near the station platform with the potential to enhance ridership.

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WATER, SANITARY SEWER, DRAINAGE AND FLOOD PLAIN

The capacity of the public utilities and drainage infrastructure, to the extent they can be enlarged to accommodate growth, will be a controlling factor for development of the Meadowview Station.

An overview/summary of the utilities and drainage issues is presented below. The reader is directed to Florin Road and Meadowview Station Areas Concept and Guidelines, Technical Report for more details. To accommodate the additional development conceptualized herein, it is assumed that these systems will be enlarged and/or improved. The studies provided the following insights, and recommendations, among the many others that are included in the technical report.

Water

- The existing system provides ample flow to serve the new development, but the system will not have sufficient pressure to serve relatively high density commercial and residential development.
- The developers of these uses will need to provide fire booster pumps to attain the needed pressure for fire suppression. This is not an unusual or prohibitive requirement.
- The development of the Meadowview Station Concept Plan will require a water tank, lift station or other mechanism approved by the City to comply with the City of Sacramento's required pressure and flow standards.

Sanitary Sewer

- The station is at the upstream end of the large sanitary sewer system that serves this area. Because of this situation, invert depths are relatively shallow, so the sanitary sewer plan proposes a series of new gravity mains on development sites that will then be fed into a lift station and thence, through a force main at 24th Street.
- The capacity of this force main constrains, to some extent, the level of development that can be achieved, but the proposed plan levels are feasible.
- Other options, including the development of very large storage tanks near the sites, have been considered, but their cost and the potential need for odor control make these options less feasible.

Drainage

- The drainage facilities presented in the TOD Concept are preliminary and at the time of development, a more-detailed study will be required.
- The conceptual storm drainage system is comprised of a network of inlets, manholes, storm drain pipes and detention basins that are sufficient to convey the 10 year – 6 hour storm event without surface flooding and will prevent structure damage for a 100-year storm event.
- The proposed system will include surface and below grade detention facilities and other measures to prevent peak surface discharges from the site.

In addition, and in keeping with contemporary water quality and water conservation practices, the plan will include:

- Vegetated swales in parks, streets, and parking lots
- Sand filters to clear runoff prior to entering storage/recycling basins, pipes or vaults
- Pervious pavements to decrease runoff and reduce contaminant levels
- Storm vaults will be the equivalent of the Jensen Precast Concrete vault

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Flood Plain

At this time, according to the latest Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), Letter of Map Revision (LOMR) dated February 21, 2007 the site is located in an area designated as a shaded Zone X. FEMA describes the shaded Zone X as: areas of 500-year flood: areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood. In regards to the floodplain, there are no elevation requirements for building in this zone. Flood insurance is recommended but not mandatory.

The area that lies to the east of the railroad tracks is currently in area designated as a Zone A99. FEMA describes Zone A99 as a Special Flood Hazard Area that could be inundated by a 100-year flood. To be protected from 100-year floods, a flood protection system is under construction. In regards to this floodplain, there are no elevation requirements for building in this zone, however, flood insurance is mandatory

The following site design guidelines are necessary to achieve the intent of the TOD urban design concept.

Theses guidelines are meant to convey the intent of the plan, which is the product of community, staff, and elected representation of the Meadowview Station area. There is an emphasis on pedestrian friendly, highly accessible streets and neighborhoods. There is an emphasis on visual amenity, as well as on safe and open vistas, so that pedestrians, especially children and seniors feel safe due to their visibility from many angles and 'eyes on the street.' The guidelines should be used to evaluate the proposals received from the development community for this location.

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A. Site Design

Ai. Development should feature pedestrian friendly blocks and streets

Ai-1 Public spaces will be visible and accessible

Ai-2 Buildings or entry courts will extend to the property line

Ai-3 Where parking is located behind buildings, it will be screened from the sidewalk.

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Ai-4 Parking access (curb cuts) will be provided to interior lots, not to individual houses, and limited in number and size.

Ai-5 The street level of mixed use buildings with commercial on the ground floor will include a large percentage of window area to ensure that the sidewalk can be seen from inside and interior lighting illuminates the sidewalk at night.

Ai-6 Trees along sidewalks and paseos will be spaced no more than 35 feet on center and will have broad canopies to provide shade.

Aii. The Development will Feature Green and Sustainable Neighborhoods

Aii-1 Open spaces shall meet Park and Recreation standards and provide diverse passive and active recreation opportunities for all age groups.

Aii-2 The TOD district will be developed to accommodate urban residential development in pedestrian friendly neighborhoods defined by landscaped sidewalks, plazas, playgrounds, and paseos.

Aii-3 There is an opportunity to reuse stormwater effluent in the parks and on the landscape areas that are a feature of the plan for this TOD. The plan for surface drainage will incorporate recycling and re-using run-off. The site drainage recommendations also include provisions for fenced and/or open detention basins or below grade reservoirs to slow the flow of surface water into the main system. Larger spaces will be designed for water detention and re-use. As shown in the master plan diagrams, the roofs of large structures like the parking structures at the transit station may be planted to reduce run-off and to permit collection and re-use of rainfall and irrigation water. The development will employ energy conserving design elements and employ alternative energy sources where feasible. Following current LEEDs practice, the developer(s) of the station area will include solar panels to supplement energy from the network.

Aii-4 The architecture of residential and mixed use buildings will incorporate design measures (many of which are already included in these guidelines) to reduce heat gain and reduce the need for mechanical air conditioning. These include inset windows, balconies, overhangs and canopies, and green roofs, where applicable.

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Aii-5 Buildings will be light colored to reduce solar heat gain. Buildings will be sited and designed to minimize east and west exposure. Large buildings such as apartment blocks and parking structures will have green roofs that shield the spaces below, provide accessible passive recreation space, and retain and recycle rain water.

Aii-6 On-site parking will be covered or planted with trees to provide an (ultimate) 75% canopy cover and screened to minimize heat absorption and radiation. Building facades immediately adjacent to the RT tracks shall have porches, exterior louvers, and double glazed windows to mitigate the visual and acoustical impact of passing transit and freight trains. Specified building materials and fabrication methods will contribute to energy conservation during manufacture, installation and after. Type 5 construction employing recycled materials and prefabricated panels are an example.

Aiii. The circulation network serves pedestrians and bicycles first and foremost.

The neighborhood will consist of blocks of mixed use development defined by streets and sidewalks designed for pedestrians and bicycles first, and then, for cars. The block pattern will follow the concepts illustrated in the TOD plan. The perimeter of neighborhood blocks may not exceed 1,600 feet with smaller blocks for townhouses, and situations where parking is in structures.

Aiv. Street design standards that accommodate pedestrians and bicycles first

Confine vehicular access to the transit station to a limited number of streets. In general only two travel lanes are required on all streets, except where shown and as needed to accommodate RT buses and shuttles serving the transit station.

Aiv-1 Parking at the curb shall be provided wherever possible.

Av. Traffic calming is essential in a TOD environment

Traffic calming is built into the street design standards for the TOD site. Since the principal objective of the TOD plan is to encourage pedestrian/transit interface, it is essential to use such devices as raised crosswalks, special pavements for pedestrian crossing, pedestrian refuge islands, and extended curbs to ensure the safety and the perceived priority of pedestrian movement.

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Avi. Pedestrian sidewalks should be visually, physically, and acoustically buffered from vehicular movement and noise.

The development guidelines recommend that curbside parking should be required on neighborhood streets and others where the right of way permits. Parked cars at the curb screen the pedestrian environment from moving traffic.

Avi-1 The sidewalk should be separated from the street by a continuous planter bed in which small shade trees will be planted no more than 35 feet on center. They will provide a real barrier and a visual screen between cars and pedestrians

Avii. Land uses, densities and intensities should be transit supportive.

Avii-1 The long range development of the transit station area will be relatively high density mixed use development over a parking structure that has ground floor retail or community facility. The whole complex will be designed to facilitate access to the transit station from the TOD neighborhood.

Avii-2 The interface between the transit station and the TOD area will be a well-designed mixed use building that includes parking for transit and for commercial civic or residential uses that are built over, under, and adjacent to the parking.

Aviii. The Transit–Rail Interface (east side of station area) will minimize acoustic and visual hazards that may be associated with transit and rail operations.

Aviii-1 Residential lots along the RT tracks shall face away from the track if possible. Property lines will be set back at least twenty four feet to permit screen planting and/or walls by the developer or RT.

Aviv. Development will carefully blend with the existing neighborhoods

Aviv-1 Where there are backyards, or front yards on a street facing into the TOD site, the plan for new development will either match that orientation or make a specific accommodation to sustain property values. Screen parking areas and alleys from existing neighborhoods. No multi-level parking structures will face existing development

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B. BUILDING DESIGN

Bi. Buildings will be designed to contribute to functions and activities that occur outside of their wall at the interface with the public environment.

Bi-1 Entrances to residential buildings will be set-in or set back

Bi-2 Shop fronts will be largely transparent and visually open

Bi-3 Sidewalk and plaza areas will be integrated into the retail and dining environment

Bi-4 Street level façades on the Meadowview Road frontage should be arcaded or set back whether retail or residential uses.

Bi-5 A variety of architectural means should be employed for privacy, security and identity.

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Bi-6 The street and the retail environments should be complementary.

Bi-7 Facades above the street level should be double glazed and articulated to reduce acoustic and visual 'noise' from the street.

Bi-8 If the market exists for neighborhood serving office space, they may occupy street level and upper levels of buildings facing on Florin Road.

Bi-9 Access to parking is prohibited from Florin Road.

Bi-10 Free-standing signs are prohibited, but projecting signs and signs on facades are encouraged.

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C. TREES RECOMMENDED

The following recommendations are adapted from the City of Sacramento Parking Lot Tree Shading Design and Maintenance Guidelines

Ci. Trees planted in parking areas, along sidewalks and on the perimeter of development areas will be compatible with eight-foot (8'-0") planter widths. Tree canopies will vary from relatively small (20 to 25 foot canopies) to large canopy shade trees. The trees will be spaced no more than 35 feet on center. These 'row trees' may be varied in patterns, or paired, or grouped, as long as the patterns relate to the often linear rights of way they shade.

C.ii Trees planted along sidewalks will be in eight-feet by sixteen-feet (8' x 16') planters, with parking bays or pedestrian and transit bulbouts between planters. On streets with driveway access to parking, the tree planters will be sized and spaced to accommodate the access points.

Cii-1 The allowable species are as follows (drought tolerant trees are favored):

- California Bay (drought tolerant)
- Chaste Tree (drought tolerant)
- Crape Myrtle
- Dutch Elm (resistant to Dutch Elm disease)
- Eastern Redbud (moderate irrigation)
- Green Vase Zelkova
- Japanese Maple
- Oak

C.iii Trees planted in public open spaces, in parks, mini parks and along the rail right of way will have relatively large canopies (30 to 35 foot canopies to provide a forest like canopy) and maximum shade. The trees will be clustered to provide shaded groves, and to define public gathering spaces. The planting patterns will feature diversity of species, foliage and flowers.

C.iii-1 The allowable species are as follows (all are drought tolerant)

- Coast Live Oak
- Holly Oak
- Cork Oak
- Eucalyptus microtheca coolbah
- Jelecote Pine
- Chinese Pistache
- Shumard Red Oak
- Green Vase Zelkova

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On the following page, a Zoning Table is presented. This table provides a comparison of the general categories of land use that are recommended in this Concept and Guidance document with the city of Sacramento's current zoning code.

As the General Plan is being revised, there maybe some modifications to the existing city of Sacramento zoning ordinance, based on recent preliminary studies and preliminary conclusions from the General Plan update effort. As an example, the DRAFT Land Use & Urban Form Workbook (June 5, 2007) explains the methodology being used:

> *With the increasing interest in urban form and implementing Smart Growth principles, the new General Plan will include a diagram and set of designations that combine direction for both land use and urban form. The system includes components that address legal requirement for allowed uses and population density and building intensity as well as urban form criteria for the different neighborhoods and centers throughout the city. These components work together to define allowed uses and building intensities as well as the overall role of each area of the city, whether it is for living (neighborhoods), gathering and employment (centers), travel and commerce (corridors), preservation (open space) or a unique role (other district) such as a college.*

In that same spirit, this set of recommended zoning guidelines aims to create a high quality mixed-use neighborhood that is responsive to the various environmental factors that surround it, and add to the neighborhood's long-term viability.

The description of 'Urban Corridor Low' in the Land Use & Urban Form Workbook relates closely to the characteristics of a TOD area and that which is proposed herein. For the 'Urban Corridor Low', the FAR is between 0.5 and 3.0, and residential densities range from 20 to 60 units per net acre, which is somewhat higher than the ceiling adopted in this set of recommendations. Conceivably, there could be designated districts within this Station area concept, such as the area closest to the RT station, which could achieve those densities in the future.

Other recommendations in the Land Use and Urban Form Workbook accord very well with the recommendations for TOD areas that are incorporated herein.

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MEADOWVIEW STATION PROGRAM			
Key Map	Recommended Land Uses	Recommended Zoning	Adopted Development Standards for Recommended Zoning
A	• Townhouses over Flats • Apartments/Condos over Retail • Retail (20,000 ft^2) Density ≈ 22-26 du/na (80% gross:net)	RMX-TO	• This zone permits multiple family residential, office and limited commercial uses in a mixture established for the area through a special planning district or adopted locational standards. • Buildings shall not exceed fifty-five (55) feet in height; however, the planning director may permit additional height up to seventy-five (75) feet in mixed use buildings with at least twenty-five (25) percent of the gross building square footage devoted to residential use, or buildings that include structured parking and open space. Any portion of a building within one hundred (100) feet of a parcel zoned or used for single-family use shall not exceed thirty-five (35) feet in height. • Net FAR of 0.4 to 3.0. • Net residential densities of 15 du/na to 60 du/na. • Nonresidential uses may occupy a maximum of fifty (50) percent of the gross square footage. • Parking for retail uses shall be provided at not more than one space per two hundred fifty (250) gross square feet. • Parking for residential uses shall be provided at a ratio of one parking space per unit plus one guest parking space per fifteen (15) parking spaces provided. Parking for non-residential uses shall be provided at not less than one space per five hundred (500) gross square feet and not more than one space per three hundred seventy-five (375) gross square feet. • The minimum front yard setback shall be zero feet. The minimum street side yard setback shall be zero feet. The minimum rear yard setback shall be fifteen (15) feet. The minimum interior side yard setback shall be five feet. Any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the front yard property line; and any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the street side yard property line.
B	• Apartments/Condos over Market • Market (30,000 ft^2) • Open Space Density ≈ 16-22 du/na (25% gross:net)	C-2-TO	• This is a general commercial zone which provides for the sale of commodities, or performance of services, including repair facilities, offices, small wholesale stores or distributors, and limited processing and packaging. • Buildings in the TO zone shall not exceed fifty-five (55) feet in height; however, the planning director may permit additional height up to seventy-five (75) feet in mixed use buildings with at least twenty-five (25) percent of the gross building square footage devoted to residential use, or buildings that include structured parking and open space. Any portion of a building within one hundred (100) feet of a parcel zoned or used for single-family use shall not exceed thirty-five (35) feet in height. • Net FAR of 0.4 to 3.0. • Net residential densities of 15 du/na to 60 du/na. • Parking for retail uses shall be provided at not more than one space per two hundred fifty (250) gross square feet. • Parking for residential uses shall be provided at a ratio of one parking space per unit plus one guest parking space per fifteen (15) parking spaces provided. Parking for non-residential uses shall be provided at not less than one space per five hundred (500) gross square feet and not more than one space per three hundred seventy-five (375) gross square feet. • The minimum front yard setback shall be zero feet. The minimum street side yard setback shall be zero feet. The minimum rear yard setback shall be fifteen (15) feet. The minimum interior side yard setback shall be five feet. Any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than

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C	• Townhouses over Flats • Medium Density Apartments/Condos • Open Space • Greenway Density ≈ 34-38 du/na (60% gross:net)	RMX-TO	• This zone permits multiple family residential, office and limited commercial uses in a mixture established for the area through a special planning district or adopted locational standards. • Buildings shall not exceed fifty-five (55) feet in height; however, the planning director may permit additional height up to seventy-five (75) feet in mixed use buildings with at least twenty-five (25) percent of the gross building square footage devoted to residential use, or buildings that include structured parking and open space. Any portion of a building within one hundred (100) feet of a parcel zoned or used for single-family use shall not exceed thirty-five (35) feet in height. • Net FAR of 0.4 to 3.0. • Net residential densities of 15 du/na to 60 du/na. • Nonresidential uses may occupy a maximum of fifty (50) percent of the gross square footage. • Parking for retail uses shall be provided at not more than one space per two hundred fifty (250) gross square feet. • Parking for residential uses shall be provided at a ratio of one parking space per unit plus one guest parking space per fifteen (15) parking spaces provided. Parking for non-residential uses shall be provided at not less than one space per five hundred (500) gross square feet and not more than one space per three hundred seventy-five (375) gross square feet. • The minimum front yard setback shall be zero feet. The minimum street side yard setback shall be zero feet. The minimum rear yard setback shall be fifteen (15) feet. The minimum interior side yard setback shall be five feet. Any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the front yard property line; and any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the street side yard property line.
D	• Medium Density Apartments/Condos • Retail (22,000 ft^2) Density ≈ 29-37 du/na (40% gross:net)	C-2-TO	• This is a general commercial zone which provides for the sale of commodities, or performance of services, including repair facilities, offices, small wholesale stores or distributors, and limited processing and packaging. • Buildings in the TO zone shall not exceed fifty-five (55) feet in height; however, the planning director may permit additional height up to seventy-five (75) feet in mixed use buildings with at least twenty-five (25) percent of the gross building square footage devoted to residential use, or buildings that include structured parking and open space. Any portion of a building within one hundred (100) feet of a parcel zoned or used for single-family use shall not exceed thirty-five (35) feet in height. • Net FAR of 0.4 to 3.0. • Net residential densities of 15 du/na to 60 du/na. • Parking for retail uses shall be provided at not more than one space per two hundred fifty (250) gross square feet. • Parking for residential uses shall be provided at a ratio of one parking space per unit plus one guest parking space per fifteen (15) parking spaces provided. Parking for non-residential uses shall be provided at not less than one space per five hundred (500) gross square feet and not more than one space per three hundred seventy-five (375) gross square feet. • The minimum front yard setback shall be zero feet. The minimum street side yard setback shall be zero feet. The minimum rear yard setback shall be fifteen (15) feet. The minimum interior side yard setback shall be five feet. Any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than

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E	• Townhouses over Flats • Medium Density Apartments/Condos • Open Space Density ≈ 32-35 du/na (40% gross:net)	RMX-TO	• This zone permits multiple family residential, office and limited commercial uses in a mixture established for the area through a special planning district or adopted locational standards. • Buildings shall not exceed fifty-five (55) feet in height; however, the planning director may permit additional height up to seventy-five (75) feet in mixed use buildings with at least twenty-five (25) percent of the gross building square footage devoted to residential use, or buildings that include structured parking and open space. Any portion of a building within one hundred (100) feet of a parcel zoned or used for single-family use shall not exceed thirty-five (35) feet in height. • Net FAR of 0.4 to 3.0. • Net residential densities of 15 du/na to 60 du/na. • Nonresidential uses may occupy a maximum of fifty (50) percent of the gross square footage. • Parking for retail uses shall be provided at not more than one space per two hundred fifty (250) gross square feet. • Parking for residential uses shall be provided at a ratio of one parking space per unit plus one guest parking space per fifteen (15) parking spaces provided. Parking for non-residential uses shall be provided at not less than one space per five hundred (500) gross square feet and not more than one space per three hundred seventy-five (375) gross square feet. • The minimum front yard setback shall be zero feet. The minimum street side yard setback shall be zero feet. The minimum rear yard setback shall be fifteen (15) feet. The minimum interior side yard setback shall be five feet. Any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the front yard property line; and any portion of each building that is twenty-eight (28) feet tall or taller shall be set back not less than ten (10) feet from the face of the sidewalk adjacent to the street side yard property line.
F	• Medium Density Apartments/Condos Density ≈ 45-56 du/na (60% gross:net)	RMX-TO	• This zone permits multiple family residential, office and limited commercial uses in a mixture established for the area through a special planning district or adopted locational standards. • Buildings shall not exceed fifty-five (55) feet in height; however, the planning director may permit additional height up to seventy-five (75) feet in mixed use buildings with at least twenty-five (25) percent of the gross building square footage devoted to residential use, or buildings that include structured parking and open space. Any portion of a building within one hundred (100) feet of a parcel zoned or used for single-family use shall not exceed thirty-five (35) feet in height. • Net FAR of 0.4 to 3.0. • Net residential densities of 15 du/na to 60 du/na. • Nonresidential uses may occupy a maximum of fifty (50) percent of the gross square footage. • Parking for retail uses shall be provided at not more than one space per two hundred fifty (250) gross square feet. • Parking for residential uses shall be provided at a ratio of one parking space per unit plus one guest parking space per fifteen (15) parking spaces provided. Parking for non-residential uses shall be provided at not less than one space per five hundred (500) gross square feet and not more than one space per three hundred seventy-five (375) gross square feet. • The minimum front yard setback shall be zero feet. The minimum street side yard setback shall be zero feet. The minimum rear yard setback shall be fifteen (15) feet. The minimum interior side yard setback shall be five feet. Any portion of each building that is

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G	Entitled Single Family Residential on R1-A		

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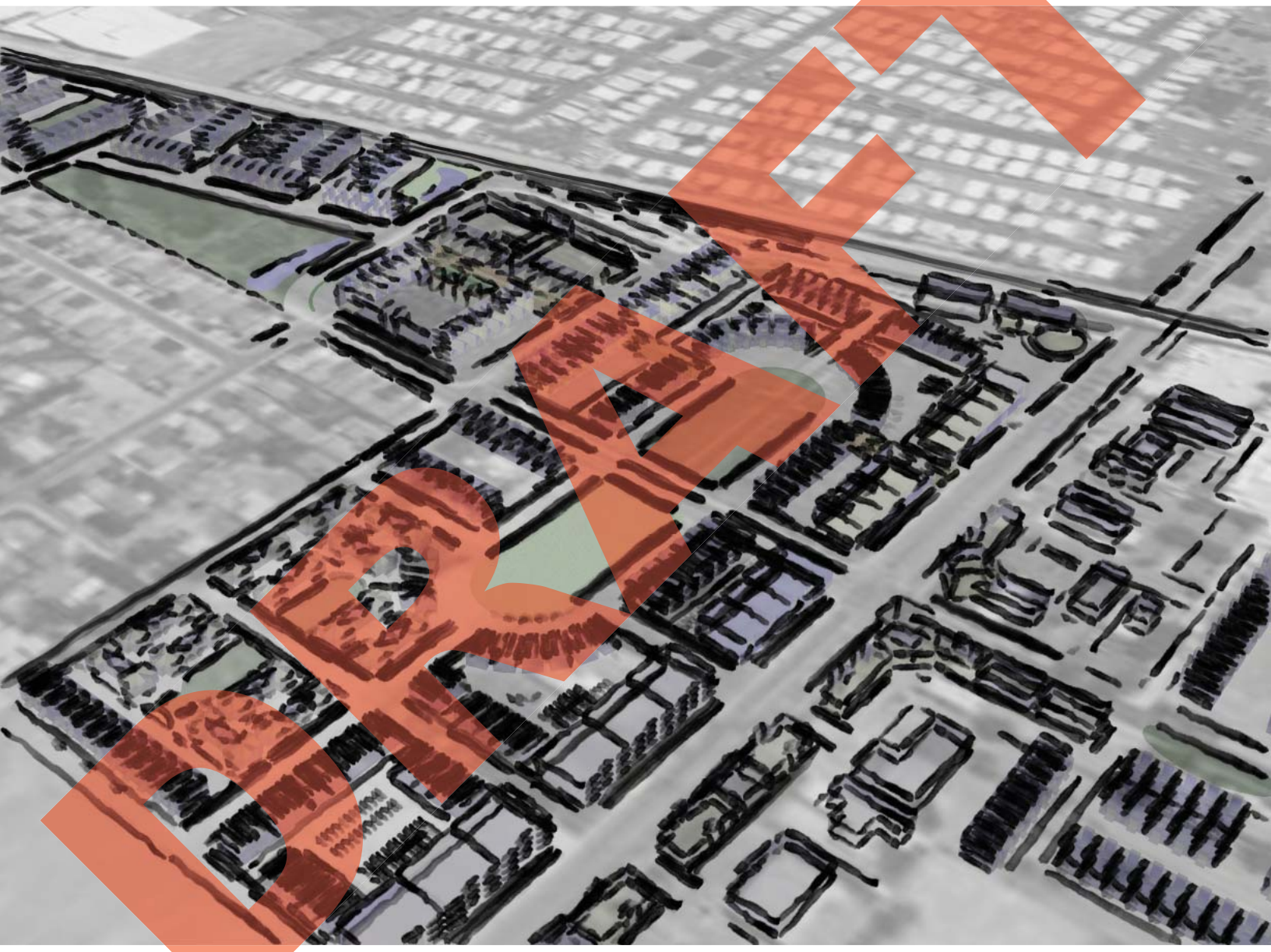
MEADOWVIEW ROAD STATION AREA

TRANSIT ORIENTED DEVELOPMENT (TOD) CONCEPT AND GUIDELINES



Technical Appendices

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CONCEPTUAL STORM DRAIN SYSTEM DESIGN SUMMARY

The proposed development of the Meadwoview Light Rail Station will require the design and installation of storm drain systems adequate to contain and convey the 10-year flows to the existing storm drain systems on Florin with no increase in peak discharges. The development includes converting the existing parking lots and open space that currently occupy the areas to medium-high density residential and commercial areas.

The proposed conceptual storm drain design has been analyzed using Sacramento Storm Water Management Models (SacSWMM). The models were developed from the current condition models of the Basin 33 (which includes the Meadowview area) and Basin 54 (which includes the Florin).

Based on the SacSWMM models of the proposed layouts, detention storage is required. The approximate volume of detention storage required for the Meadowview Station development area is 1.2 acre-ft (for development south of Loma Verde Way only). Detention design may incorporate underground and/or above ground storage subject to City approval. The detention design should be installed at a location close to the most downstream point of the development. This will provide the maximum benefit while simplifying the design. For the analyses presented in this report, detention storage was modeled as vertical storage wells connected close to the most downstream end of the developments.

Grading of the development sites should provide adequate above ground (street) storage to mitigate any increase in the 100-year storm. The objective of the grading will be to reduce offsite discharge of 100-year storm flows to pre-development conditions. In addition, the 100-year design event water surface elevations should be considered in setting the building pad and threshold elevations.

1 Introduction

1.1 Background

The development area that this report discusses is defined by a roughly 1 mile radius semicircle centered on the existing Meadowview Light Rail Transit (LRT) station in the City of Sacramento, California and bound to the east by the LRT alignment.

This area has been targeted for redevelopment including plans to significantly increase the residential density. Parsons Brinckerhoff Quade & Douglass, Inc (PB) of Sacramento was contracted to assist in the planning stage of the project and PB has contracted with WRECO to develop a conceptual sanitary sewer system plan and study for the conceptual development plan.

1.2 Objective

The objective of this report is to outline the conceptual storm drain design, summarize the hydraulic analysis, and provide guidance and considerations for further development of the design. The conceptual storm drain design presented is based on the preferred layout configuration Meadowview 1B as presented by PB.

1.3 Location

The existing LRT station is located in the southern part of the City of Sacramento along the axis of the LRT tracks whose alignment is roughly north-north west to south-southwest. Meadowview Station is several miles from the Sacramento River.

1.4 Planned Development

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The planned development consists of a mixture of development types. These include areas of single-family homes, town-homes, multifamily residential, mixed-used (i.e., residential with commercial in the ground story), commercial, and public open space. These areas are all in addition to the LRT station, which includes structured parking and transit supportive uses.

PB and its architect sub-consultant developed several development scenarios. Among these, WRECO was asked to evaluate Meadowview 1b scenario. Subsequently, Meadowview 1b was modified but the planning level estimates provided by this report remain adequate for guidance.

1.5 Existing Systems

The City of Sacramento already has a completely built sanitary storm drain system surrounding the development area.

Meadowview Development Area

The Meadowview development area is part of the City's 'Sump 33' storm drain basin. Sump 33 is 702 acres in size, including the 55 acre Meadowview development area. Flows are generally collected along the streets and routed via storm drains to a trunk line along Meadowview. The trunk line on Meadowview terminates at Sump 33, where the flows are conveyed to a flood control channel located South of Meadowview via a 54" force main.

2 Layout Design

2.1 General

The conceptual drainage design layout for the Meadowview development area is shown on page **Error! Bookmark not defined.**.

For the conceptual storm drain design, the receiving facilities were identified and the most practical route for the proposed storm drains was established. This route considered the requirement of sufficient number of facilities to provide efficient drainage of the areas served. Manholes (nodes in the hydraulic model) were placed along the storm drains. These nodes generally have a particular catchment area associated with them and will be designed with inlets sufficient in capacity to drain the 10-year design storm with no flooding.

Grade and invert elevations for the conceptual design is primarily based on approximate existing grade elevation with consideration to the elevation at which the proposed systems will tie into existing systems. The minimum pipe slope used is 0.5% to insure adequate flow velocities, and the minimum pipe diameter used is 12-inches.

2.2 Meadowview Development Area

The layout of the conceptual storm drain system for the Meadowview Development shown in Exhibit B includes an area north of Laguna Verde which has since been further developed by Morton Pitalo Engineers. Although WRECO has started the design and has performed analyses of this area, the focus of this report is on the area south of Laguna Verde. The area south of Laguna Verde will drain south via a storm drain system towards Meadowview. At Meadowview, the storm drain system connects to the existing trunk line which drains west to Sump 33, located just west of 22nd street.

2.3 Design Guidelines

A list of proposed guidelines for design and hydraulics of the storm drain systems is as follows:

- Recommended pipe materials to be used include RCP (Class 3) to meet the design velocity, flow capacity, and bearing capacity required at the site. Variations may be acceptable as long as it meets City of Sacramento design guidelines.

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- Manning's 'n' value will be 0.015 for RCP.
- Minimum pipe full velocity of 2 ft/s.
- All pipes should have a minimum of 18 inches of cover from the sub-grade.
- Placement of the pipes will be per City guidelines except where this conflicts with existing utilities, in which case design is subject to the approval of the City.

3 Hydrologic and Hydraulic Analyses

3.1 General

Hydrologic and hydraulic analysis of the proposed drainage system was done using the SacSWMM software. The conceptual design models were developed from existing SacSWMM models for Sump 54 (Florin Development Area) and Sump 33 (Meadowview Development Area) provided by the City of Sacramento.

3.2 Model Description

The SacSWMM model is made up of two modules: the Runoff Module and the Extran Module. The Runoff module is made up of the rainfall data and the catchment data. The rainfall data is input as rainfall intensity for each time-step of the model. The information input for each of the modeled nodes (catchments) includes:

1) Node Number
2) Catchment Width
3) Catchment Area
4) Percentage of the area that is impervious
5) Catchment overland slope
6) Manning's 'n' for the impervious area
7) Manning's 'n' for the pervious area
8) Storage (abstraction) on the impervious area
9) Storage (abstraction) on the pervious area
10) Initial infiltration rate
11) Final (minimum) infiltration rate
12) Decay rate of infiltration rate

The Extran module is made up of conveyance element data, junction data, and storage data. More data types (including pump data, orifice data, and weir data are included but were not modified, nor created in our models.

The information input for each conduit in the conduit data includes:

1) conduit number
2) Upstream and downstream nodes (junctions)
3) Size and shape of the conduit
4) Length of the conduit
5) Flowline elevation of the conduit relative to both the upstream and downstream junction inverts.
6) Manning's 'n' values
7) Shape and configuration of the overflow (street) section (if applicable)

The information input for each junction in the junction data includes:

1) Junction (node) number
2) Grade elevation
3) Invert elevation
4) Constant flow at junction

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5) Cumulative length of curb inlets immediately tributary to the node
6) Curb inlet weir coefficient

The storage data includes the following information:
1) Junction (node) number
2) Crown elevation of the storage node
3) Storage geometry (either in cubic feet per foot elevation or in stage-area pairs)

3.3 Output Description

The output of the Runoff module is inflow hydrographs at each of the various nodes. This output is used during the execution of the the Extran Module by applying the hydrographs at each node to the junction data from the Extran Module input. The Extran Module output includes detailed temporal data for each of the elements defined in the model.

4 Detention Storage

4.1 General

The conceptual drainage design for the Meadowview development area utilizes detention storage to reduce the post-development peak hydraulic grade line at the most downstream end of the development areas. The effective result of using storage means there is equal or less stress on the receiving facilities than in the pre-development condition.

4.2 Conceptual Design

Based on an iterative process of sizing the detention and comparing the model results to the predevelopment results, the approximate required detention volume for the Meadowview development is 1.2 acre-ft. The City of Sacramento's SacSWMM specialist Martin Farber aided WRECO in developing a stable hydraulic model of the detention storage.

The location of the detention facilities is not definitive, but the final design of the detention facilities should be analyzed to determine adequacy in reducing the hydraulic grade line at the downstream end of the project area to predevelopment conditions. Schematics of the analyzed detention facilities are shown on page **Error! Bookmark not defined.**.

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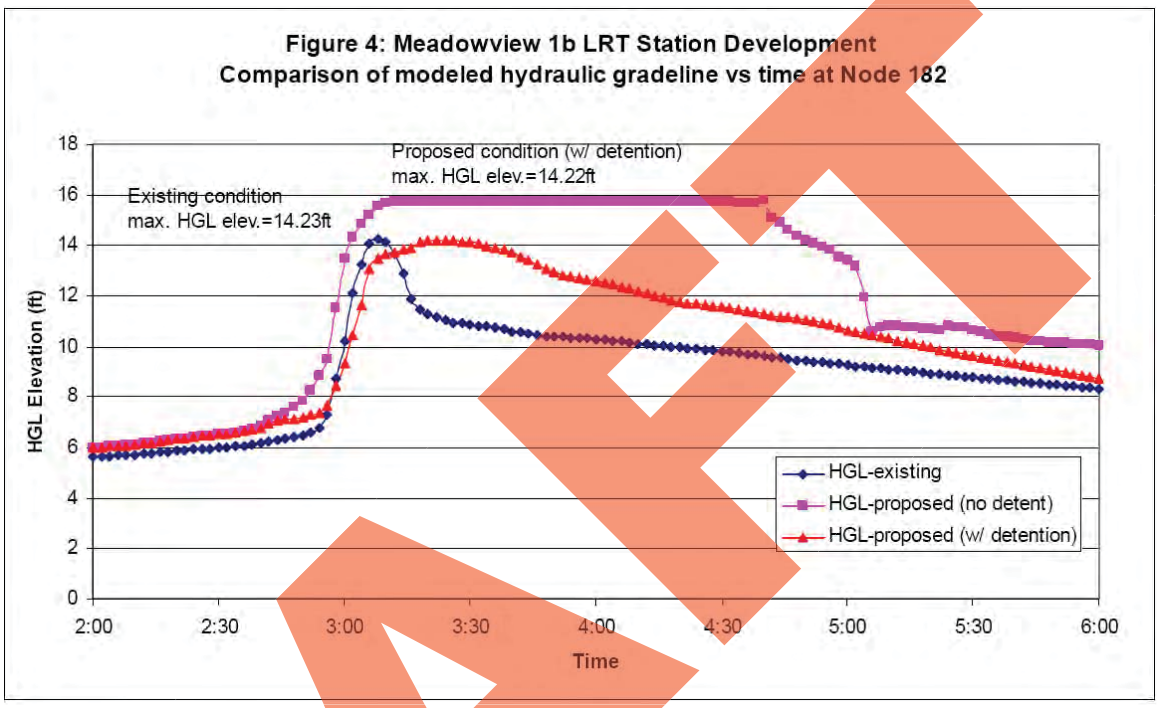
4.3 Results

The following figure shows a comparison of the hydraulic grade at the most downstream point in the Meadowview development area.



4.4 Alternatives

Some possible alternatives to the design and location of the detention facilities include:

1) above ground detention basin – can act as a water quality facility as well
2) below ground detention vault
3) below ground detention pipe arrays

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5 Cost Estimate

A cost estimate of the storm drain facilities presented in the conceptual plan has been developed. A summary of the cost estimate is shown below:

Conceptual storm drain design cost estimate for Meadowview development area (south of Laguna Verde Only)						
Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item
1	620904	12 IN. APC	LF	1640	$45.72	$74,981
2	620909	18 IN. APC	LF	956	$59.44	$56,821
3	920913	24 IN. APC	LF	2228	$68.58	$152,796
4	707050	Drainage Inlet	EA	60	$2,000.00	$120,000
5		5FTx5FT RCB culvert	LF	55	$250.00	$13,750
6	707051	Drainage Manhole	EA	26	$3,500.00	$91,000
7		Detention Basin*	EA	1	$170,000.00	$170,000
*based on $100/ft for 1700 feet 72" corrugated pipe (~1.1acre-ft)						
					Construction Total	$679,348

6 Summary and Recommendations

The conceptual design of storm drain system for the Meadowview development area is a good starting point for the development of the final design documents

Major considerations in the development of the design of the Meadowview development include:

1) The inclusion of detention facilities sufficient to reduce the 10-year peak flow from the development to pre-development levels.
2) Grading the development area in such away to provide sufficient surface storage for the 100-yr event without increasing peak surface discharge from the site.
3) Designing the top of slab and finished floor elevations of the buildings to be above the 100-year flood elevations.
4) Incorporation of acceptable and permanent Best Management Practices.

The objective in refining the detention facilities design will be to fit the facilities into the design, size the facilities appropriately, and provide the city with a representative SacSWMM model which shows that there is no negative impact to the stress (hydraulic grade line) on the receiving systems. This design effort should be pursued with coordination with the City of Sacramento for development of an acceptable plan.

Grading the development area to decrease the peak overland discharge from the site to predevelopment levels is complicated by the changes in the overland flow destinations. Conditional to acceptance by the city, an appropriate location for a target (existing condition) overland flow value might be the peak value at the most downstream junction for the respective development areas. This corresponds to the SacSWMM models' Junction 182 for Meadowview. The grading can be modeled as 'wine-glass' storage nodes, or by appropriate surface geometry definitions in the conduit cards. Contingent on successful grading of the development areas, consideration of the model results should be used to insure that 100-year water surface elevations are below the proposed buildings' threshold elevations.

The City of Sacramento has indicated several storm water management techniques for water quality. These accepted BMPs include:

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1) WQ/Detention basin
2) Vegetated swales
3) Sand filters
4) Pervious pavements
5) Jensen Precast Concrete storm vault

The successful development of the final design plan for the storm drainage in Meadowview LRT development area is dependant on the compliance and coordination with the City of Sacramento. The conceptual design presented has been evaluated by the City and is principally acceptable.

7 References

City of Sacramento 1990, "Design and Procedures Manual and Improvement Standards", City of Sacramento Department of Public Works, September 1 1990.

City of Sacramento 1996, "Sacramento Storm Water Management Model", Montgomery Watyson, January 1996.

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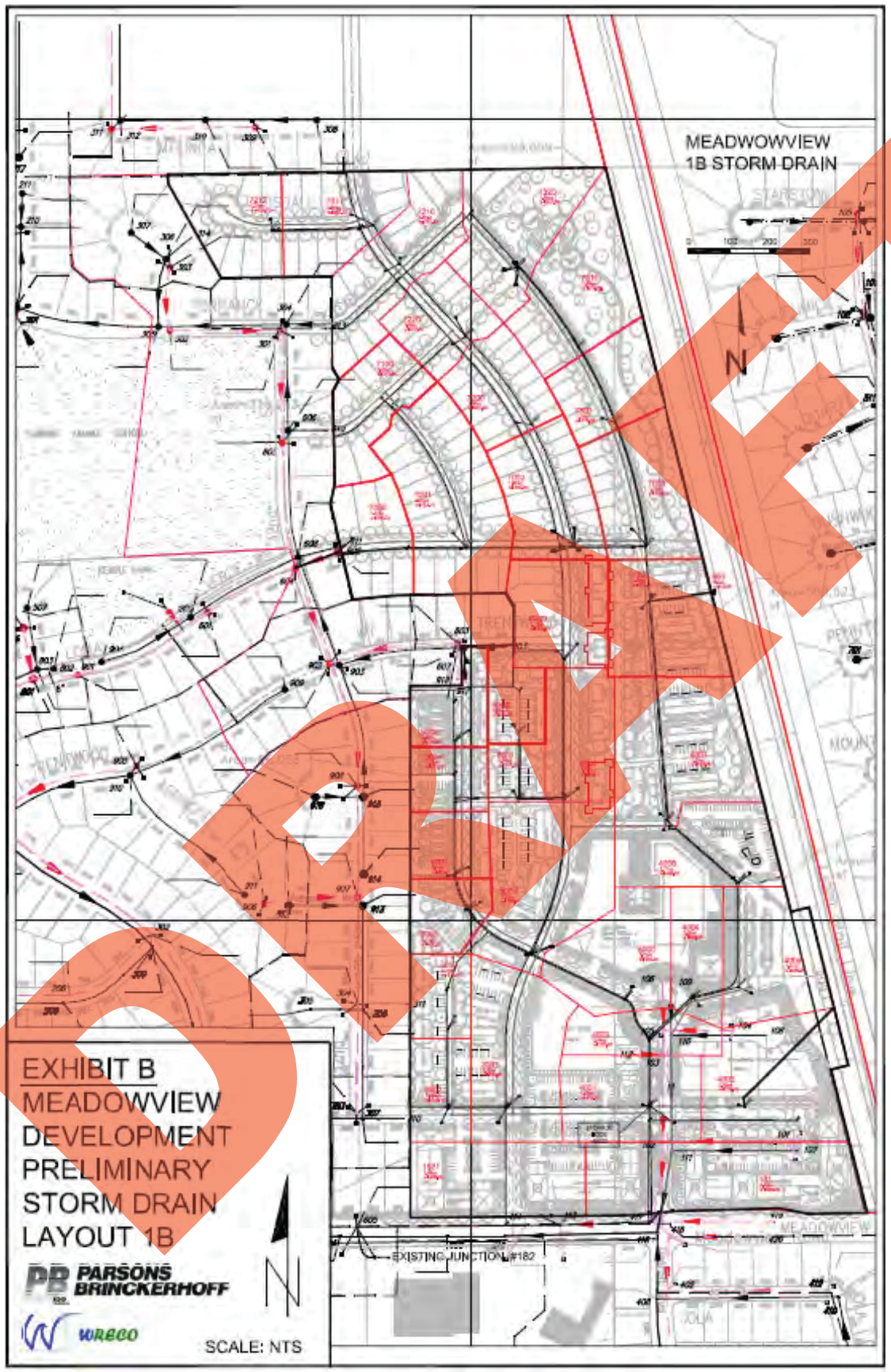
MEADOWVIEW
1B STORM DRAIN
N
EXHIBIT B
MEADOWVIEW
DEVELOPMENT
PRELIMINARY
STORM DRAIN
LAYOUT 1B
PARSONS BRINCKERHOFF
WRECO
SCALE: NTS
EXISTING JUNCTION #182
MEADOWVIEW

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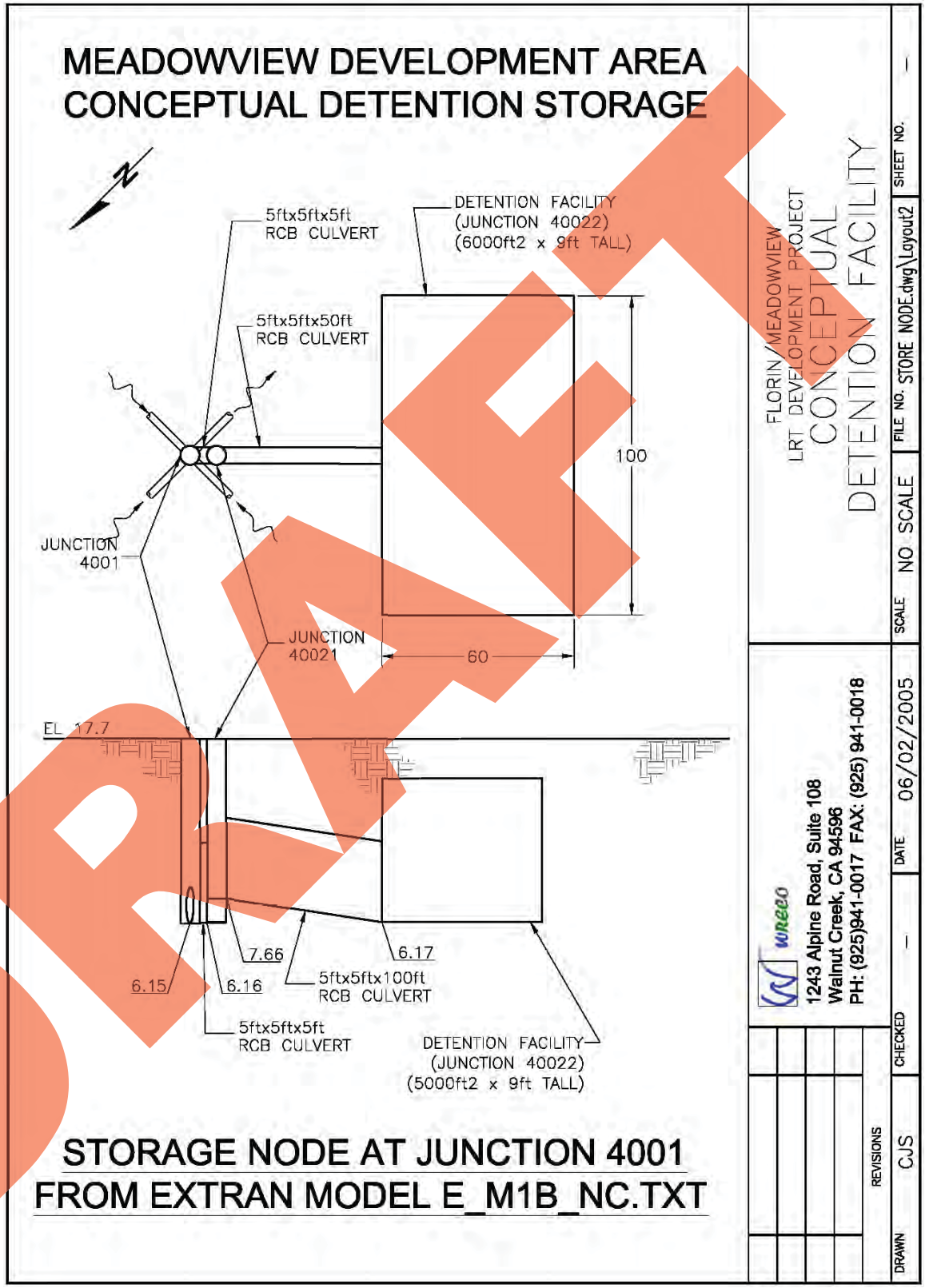
MEADOWVIEW DEVELOPMENT AREA
CONCEPTUAL DETENTION STORAGE
N
5ftx5ftx5ft
RCB CULVERT
DETENTION FACILITY
(JUNCTION 40022)
(6000ft2 x 9ft TALL)
5ftx5ftx50ft
RCB CULVERT
100
JUNCTION
4001
JUNCTION
40021
60
EL 17.7
7.66
6.17
6.15
6.16
5ftx5ftx100ft
RCB CULVERT
5ftx5ftx5ft
RCB CULVERT
DETENTION FACILITY
(JUNCTION 40022)
(5000ft2 x 9ft TALL)
STORAGE NODE AT JUNCTION 4001
FROM EXTRAN MODEL E_M1B_NC.TXT
FLORIN/MEADOWVIEW
LRT DEVELOPMENT PROJECT
CONCEPTUAL
DETENTION FACILITY
1243 Alpine Road, Suite 108
Walnut Creek, CA 94596
PH: (925)941-0017 FAX: (925) 941-0018
SHEET NO.
FILE NO. STORE NODE.dwg\Layout2
SCALE NO SCALE
DATE 06/02/2005
CHECKED
DRAWN CJS
REVISIONS

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CONCEPTUAL SANITARY SEWER SYSTEM DESIGN SUMMARY

Transit-Oriented Development is planned for the area in the vicinity of the Meadowview Light Rail Transit (LRT) station in the City of Sacramento, California (City). Parsons Brinckerhoff developed conceptual development plans and contracted with WRECO to develop a conceptual sanitary sewer system for this plan.

Flow monitoring data indicate that the existing sanitary sewer systems surrounding the area have insufficient available capacity to accommodate all of the new flow generated by the planned development. The main at Meadowview Road west of 24th Street, is downstream of the areas' system and has sufficient capacity. An additional constraint is that the existing system is at the extreme upstream end of the larger area sanitary sewer system and, consequently, invert depths are relatively shallow.

The conceptual sanitary sewer system design was developed following the City's design criteria, guidance from City staff and standards of hydraulic engineering practice. The layout allots as much flow as possible to the existing system by connecting buildings near the development zone boundaries to the nearest existing mains. For the remainder of the flow, the design includes gravity systems that drain to sewage lift stations located in the middle of the development zone. The design further includes several thousand feet of new force main from the lift stations to the main at Meadowview Road west of 24th Street.

The report recommends building new force mains as a solution to the limited existing system capacity rather than storage tanks because the tanks would need have several million gallons of capacity to safely store flow from peak flow period for later release during low flow periods. The report also includes conservative estimates of new pipe lengths, trench lengths broken down by trench depth, and lift station pump sizes.

1 Introduction

1.1 Background

The Development Zone that this report discusses is defined by a roughly one mile radius semicircle centered on the existing Meadowview Light Rail Transit (LRT) station in the City of Sacramento, California and bound to the east by the LRT alignment. This region has been targeted for redevelopment including plans to significantly increase the residential density. Parsons Brinckerhoff Quade & Douglass, Inc (PB) of Sacramento are assisting in the planning stage of the project and PB has contracted with WRECO to develop a conceptual sanitary sewer system plan and study for the conceptual development plan.

1.2 Objective

WRECO prepared the conceptual plan and study primarily to determine what measures will be necessary to guarantee sufficient capacity for the conceptual development plan. In addition, the plan was developed to suggest general guidelines for laying out a more finalized sanitary sewer system in the future.

1.3 Location

The existing LRT station is located in the southern part of the City of Sacramento along the LRT tracks, which is oriented approximately from north-north west to south-southeast. The Meadowview area is about two miles from the nearest Sacramento County Sanitation District Number One (District) intertie.

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1.4 Planned Development

The planned development zone consists of a mixture of development types. These include areas of single-family homes, townhomes, duplexes, multifamily residential buildings, mixed-used (i.e., residential with commercial in the ground story) buildings, commercial buildings and public space.

These areas are all in addition to the LRT station, which includes structured parking and transit supportive uses. The table below summarizes the characteristics of the planned development zone that were analyzed for the conceptual sanitary sewer system. Subsequently, these assumptions were modified but the planning level estimates provided by this report remain adequate for guidance.

Meadowview Area Planned Development Summary			
Description	Units	Footprint Extent	
		(ft^2)	(acres)
Standard Single Family	140		
Medium Density	359		
Live-Work	104		
Townhouses	41		
Flats	41		
Mixed Use-Commercial		83,329	1.91
Commercial		118,704	2.73
Transportation Corridor		143,060	3.28
Open Space		87,556	2.01
TOTALS	685	432,649	10.00

1.5 Existing System

The City of Sacramento already has an existing sanitary sewer system surrounding the development area (see Figure 1). Two mains, the main under Meadowview Road and a main under Gardendale Road collect the flow from the area surrounding the Meadowview development area. The Gardendale main drains to the 24th Street main and contributes to the flow draining to the lift station. The Meadowview main flows west towards 24th Street.

All of the Meadowview area flow drains to the Meadowview main. The Meadowview main, in turn, drains to a 96 in Sacramento County Sanitation District main running under Freeport Boulevard, about 1.5 miles west of 24th Street. In the past, the area likely drained to the now-decommissioned Meadowview Sewage Treatment facility.

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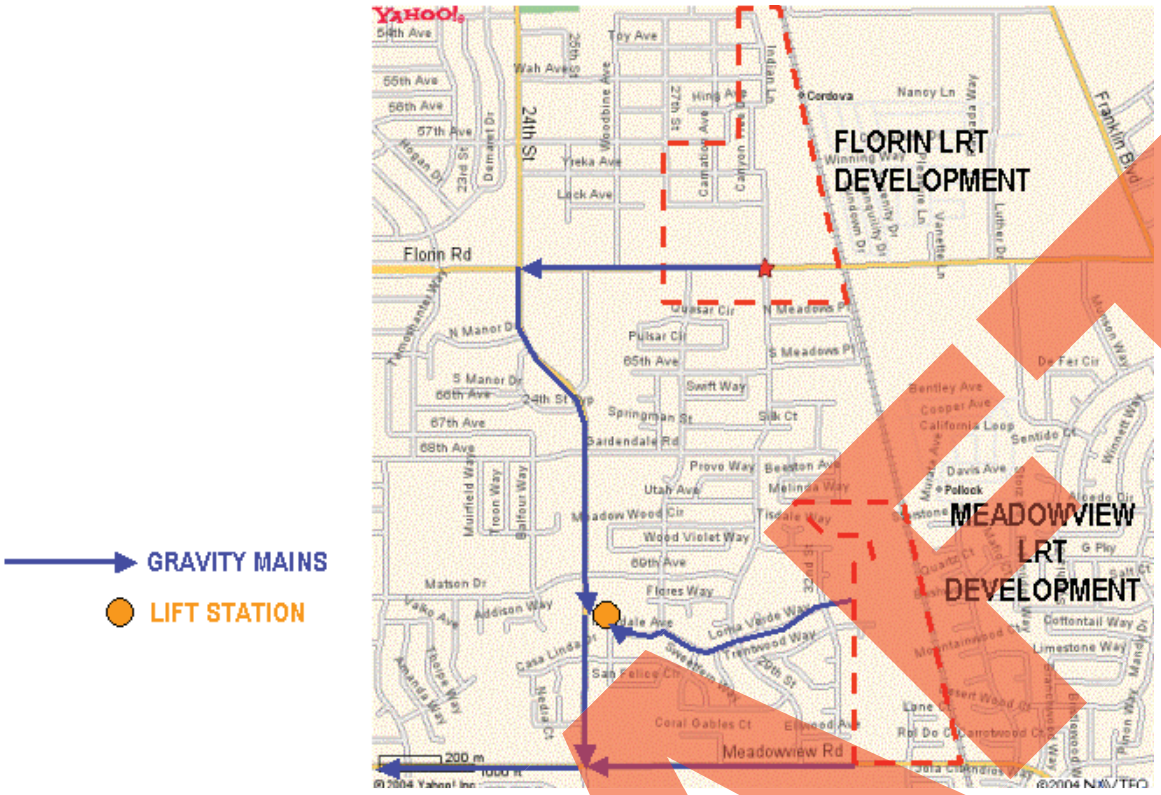

Figure 1

1.6 Constraints & Opportunities

Sacramento is a city built on flat land. Consequently, gravity-based sanitary sewer systems can travel only a limited distance before requiring a lift station to continue moving flow through the system, particularly when the system experiences peak flows.

Also, the Meadowview development zone is at the extreme upstream end of its City sanitary sewer system and that system was apparently designed with no more than single family home-level density in mind. Consequently, the mains in the immediate vicinity of the development zone for which data were available for this study are relatively shallow and have little remaining capacity. In fact, many of those mains are already operating at or near capacity. No capacity data were available for the District sewer system.

2 Analysis

2.1 Design Flow Estimate

WRECO estimated design flows for the Meadowview development zone based on the City's Design Criteria and PB's descriptions of the zones broken down by development type. The City's Design Criteria provide method for estimating flows per developed unit for domestic development and for all other types by determining equivalent developed units based on building footprint area.

Based on the method in the Criteria, flows for residential units were estimated based on the numbers of units and the density for each type of development. The Criteria specifically indicates higher per flows per developed unit for single family homes than for units in multi-family buildings, which is a typical assumption for estimating wastewater flow.

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Meadowview Development Zone Sanitary Sewer Conceptual Design Flow										
Type	Description	Units	Footprint Extent (ft²)	Equivalent DU's/1,000 ft²	Equivalent DU	Toal DU's	Average Flow (MGD)	Peaking Factor	Peak Design Flow (MGD)	Peak design Flow (cfs)
Domestic										
	Standard Single Family	140			0	140	0.056			
	Medium Density	359			0	359	0.108			
	Live-Work	104			0	104	0.031			
	Townhouses	41			0	41	0.012			
	Flats	41			0	41	0.012			
Commercial/Municipal/Industrial										
	Mixed-Use Commercial	0	111,754	0.2	17	17	0.005			
	Commercial	0	118,704	0.2	24	24				
	Transportation Corridor	0	12,800	0.2	29	29	0.009			
	Open Space	0	87,556	0.2	18	18	0.005			
	Total	685	432.649		88	773	0.239	2.8	0.678	1.050

2.2 Existing Sewer System Capacity

The City and Morton Pitalo[1] arranged for monitoring equipment to record flows at certain locations. These locations were chosen on sewer mains known to collect flow from the development area.

The following table lists the mains examined and where in the new development zones flow seen in the mains would originate, assuming the new development zones were to connect to the City's existing sanitary sewer system.

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[1] Buzz Oates, the development company that owns the northern, single family home, portion of the Meadowview LRT Station Development Zone hired Morton Pitalo as a civil engineering subconsultant.

Sewer Mains and Flow Allocation			
Main No.	Location	Pipe Size (in)	Would Receive Flow From
1	Florin Road at 29th Street	10	Entire Florin Zone
2	Loma Verde Way at Meadowdale Ave	8	Northern part of Meadowview Zone – Single family homes
3	Meadowview Road at 29th St	12	Southern part of Meadowview Zone
4	Meadowview Road, east of 24th St	12	Southern part of Meadowview Zone - downstream of Main 3.
5	24th Street at Meadowview Road	15	Downstream of confluence of Mains 1 and 2 and existing lift station.
6	Meadowview Road, west of 24th St	18	Confluence of all flows from both zones

Full Pipe Capacity

Full pipe capacities for the existing sewer system surrounding the development area were estimated either using Manning's equation taking slope, diameter and material as arguments or reproduced from Morton Pitalo (2004), which also used Manning's equation.

Full Pipe Capacities	
Location	Full Pipe Capacity (cfs)
Florin Road at 29th Street	0.85
Meadowview Road at 29th Street	1.34
Meadowview Road, east of 24th Street	1.15
24th Street at Meadowview Road	1.94
Loma Verde Way at Meadowdale Avenue	0.58
Meadowview Road, west of 24th Street	4.53

Flow Monitoring

Monitoring equipment recorded flow in the mains every five minutes for at least 60 days at each location in order to determine maximum and minimum flows. The following table presents the results and remaining capacities based on the results. Remaining capacity is the capacity of a given pipe to carry additional flow above and beyond the maximum flow currently seen in the pipe and is equal to Full Pipe Capacity minus Maximum Observed Flow. Minimum Observed Flow is used for storage tank sizing.

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Monitoring Results Summary and Remaining Capacities				
Location	Minimum Observed Flow (cfs)	Maximum Observed Flow (cfs)	Full Pipe Capacity (cfs)	Remaining Capacity (cfs)
Florin Road at 29th Street	0.22	0.47*	0.85**	0.38
Meadowview Road at 29th Street	0.10	0.55	1.34	0.79
Meadowview Road, east of 24th Street	0.15	0.86	1.15	0.29
24th Street at Meadowview Road	0.21	1.36*	1.94	0.58
Loma Verde Way at Meadowdale Avenue	0.03	0.29*	0.58	0.29
Meadowview Road, west of 24th Street	0.36	2.22	4.53	2.31

*Certain data points were not included in the analysis of the data. These were unusually high stage readings most likely due to temporary plugging of the weir in the monitoring device. Final consideration of the validity of this data sampling should be verified by the City of Sacramento Department of Utilities.
**Capacity based on slope indicated in original system design drawings. Neither as-builts nor survey for the Florin Road main were available.

2.3 Model

Hydraulic models of the conceptual sanitary sewer system were developed using Hydraflow StormSewers 2005. The model took surface elevation and flow data and was used to determine main size requirements in the system.

3 Results

3.1 Flow Monitoring

The flow monitoring study results indicate the following:

- The existing Loma Verde Way main that would collect flow from the northern part of the Meadowview Zone has 0.29 cfs of remaining capacity
- The existing Meadowview Road main that would collect flow from the south end of the Meadowview Zone has 0.29 cfs of remaining capacity.
- The main that collects flow from the development area, Meadowview Road west of 24th Street, has remaining capacity (2.31 cfs) sufficient to accommodate the estimated combined flow from the new developments (2.20 cfs).

4 Conclusions & Recommendations

4.1 Gravity Flow Accommodation

Shallow Mains

The mains nearest to the new development zones generally have inverts no lower than 7 feet below the existing land elevation. The new development zones will require extensive new mains, some of them over one thousand feet long. The mains collecting flow from the homes and buildings will flow by gravity and will reach depths far below the available existing main inverts, were they connected to those mains. Consequently, the existing mains immediately surrounding the zones can collect flow only from the development closest to those mains. For the remainder of the development, lift stations will be required to convey flow out of the zones.

Lift Stations

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In a sanitary sewer system with a lift station, flows travel by gravity to a collection tank at the lift station. A pump then lifts the sewage out of the tank and impels it into a new main that flows under pressure (i.e., a "force" or "pressure main" rather than a "gravity main"). In order to minimize tank invert depth, the optimal location for a lift station is a location resulting in the minimum possible gravity main length, which is usually the center of the area that drains to the station.

4.2 Capacity

In addition to being shallow, the mains immediately surrounding the new development zone lack sufficient capacity to accommodate all the additional flow from the zone. The 18-inch main in Meadowview Road west of the intersection with 24th Street that collects flow from the Meadowview zone, does have sufficient capacity for all the development, though. Consequently, the conceptual plan allots flow from the zone to make the best use of the available capacity by assigning some of the new mains to connect to the existing mains in the surrounding area.

- The 0.29 cfs or remaining capacity in the Loma Verde 8-inch main is sufficient to accommodate flow from approximately 128 of the 140 proposed single family units at the north end of Meadowview Zone.
- The 0.29 cfs of remaining capacity in the Meadowview main is sufficient to accommodate flow from the proposed 104 live-work units and limited commercial development at the south end of the Meadowview Zone.
- The 0.38 cfs of remaining capacity in the Florin main is sufficient to accommodate flow from approximately 208 residential townhouse or higher density units plus all the commercial development at the south end of the Meadowview Zone.

After allotment of these areas that are nearest to the available mains surrounding the zones, conveying the new zones' remaining flow requires an approach to accommodate the lack of capacity in the nearby mains during peak flow periods. There are two principle ways to accomplish this: storage tanks and new/expanded mains.

Storage Tanks

The lift stations will already include sump tanks as a part of their design. These tanks, however, will be only large enough to maintain consistent flow levels in the force main. One method for accommodating limited capacity in the nearby mains is to only pump flow into those mains during off-peak times. Accomplishing this would require increasing the lift station sump tanks' storage capacity dramatically so that would be large enough to store several hours' worth of flow. The resulting tank at the lift station would have several million gallons of capacity.

New/Expanded Mains

The second approach is to bypass or replace the mains with insufficient capacity. This approach would include either:

- Construction of several thousand feet of new force main from both lift stations to the 18-inch main at Meadowview Road west of 24th Street
- Upgrading of the existing mains to sizes sufficiently large to accommodate flow from the zones and construction of new force main from the lift stations to the upgraded mains.

4.3 Suggested Alternative

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WRECO's conceptual design includes construction of a lift station in the center of the Meadowview Development zone and installation of new force mains out to the main at Meadowview and 24th. The new force main alternative is considered preferable to the sump tank alternative primarily because of the exorbitant costs and odor issues of large sewage holding tanks. The following figure depicts the suggested alternative.

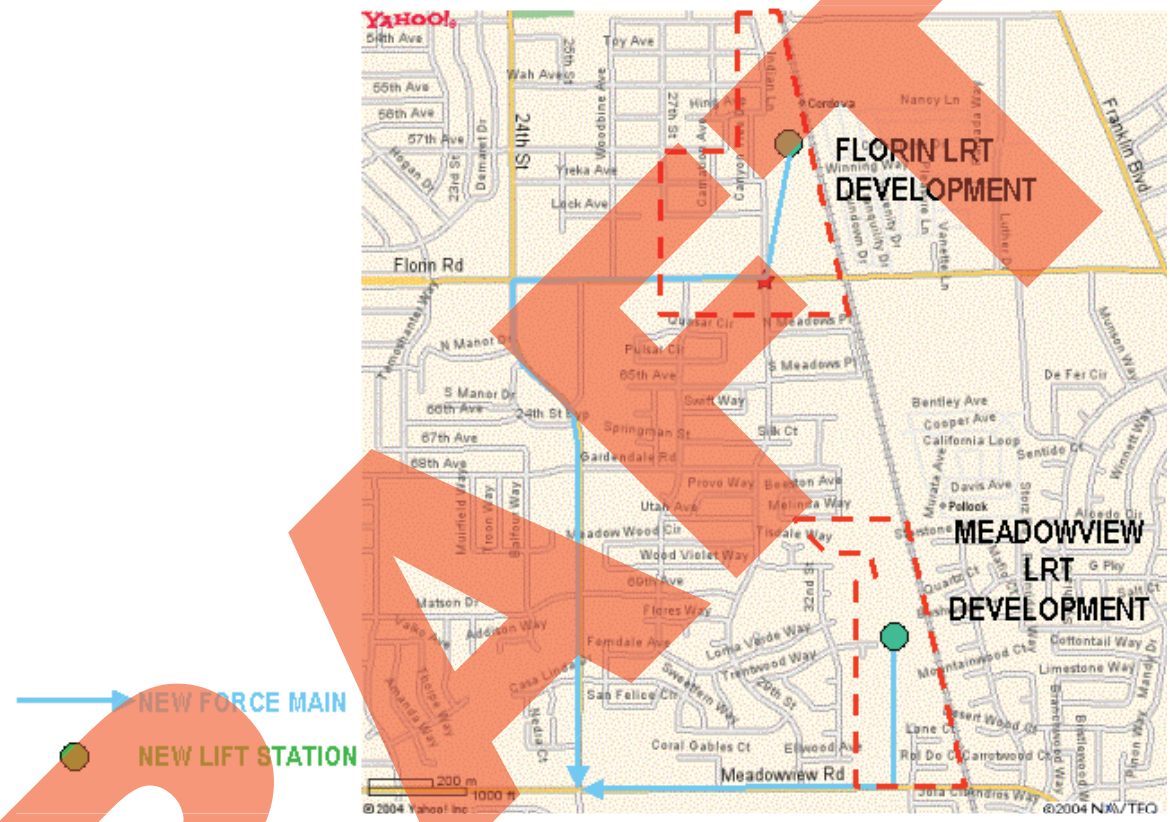

Figure 2

Conceptual Design

WRECO's conceptual sanitary sewer system design for the Meadowview Development Zone includes one lift station, with a main that flows under gravity from the edges of the zone toward a lift station in the middle. The conceptual layout on page 83 assumes connections to the existing system will collect flow from part of the zone and gravity mains draining to a lift station will collect the rest.

Trenching Depths

The following table lists pipe and trenching length estimates broken down by trench depth intervals for the conceptual sanitary sewer system. In order to provide a conservative estimate for planning purposes, the estimates given assume gravity mains sufficient to collect all flows in the zone.

Specifically, the estimates give length and trench depths for gravity mains extending to the extreme north and south ends of the zone to a lift station at the middle, as opposed to the shorter gravity main lengths in the conceptual layout, which assumes connections to the surrounding system.

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Preliminary Pipe and Trenching Quantities – Meadowview	
Item Description	Estimated Length (feet)
8 in Force Main	4,580
Trench, Force Main, Shallow (5 ft - 8 ft)	4,580
8 in Gravity Main	4,580
10 in Gravity Main	600
Trench, Gravity Main, Shallow (5 ft - 8 ft)	4,200
Trench, Gravity Main, Mid-Depth (8 ft - 12 ft)	685

Lift Station Sizing

The lift station will need to have sufficient pumping capacity to accommodate peak flow from the area and will require at least two pumps per station with that capacity to guarantee operability in the case of failure. Though the conceptual design assumes the lift station would collect only some of the flow from the surrounding area, the figures given in the table below are for planning and conservatively assume that the lift station will collect all flow in the zone.

Preliminary Lift Station Sizing				
Development Zone	Lift Height (ft)	Force Main Length (ft)	Required Capacity (gpm)	Recommended Single Pump Power (HP)[1]
Meadowview	18	4,580	594	7.5
[1] Pump power from FLYPS 2.1 pump selection software, assuming 8-inch steel pipe.				

References

Morton Pitalo 2004, "Sewer Study for Meadowview Station, City of Sacramento, Sacramento, California", Morton & Pitalo, Inc., September, 2004.

City of Sacramento 1990, "Design and Procedures Manual and Improvement Standards", City of Sacramento Department of Public Works, September 1 1990.

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EXHIBIT A
FLORIN ZONE
CONCEPTUAL SANITARY
SEWER LAYOUT
PARSONS BRINCKERHOFF
WOREGO
NEW FORCE MAIN
NEW GRAVITY MAIN
EXISTING CITY GRAVITY MAIN
EXISTING COUNTY GRAVITY MAIN
N
SCALE: NTS

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CONCEPTUAL WATER SYSTEM DESIGN SUMMARY

Transit-Oriented Development is planned for the area in the vicinity of the Meadowview Light Transit (LRT) station in the City of Sacramento, California (City). Parsons Brinckerhoff developed conceptual development plans for the Florin zone and contracted with WRECO to develop conceptual water systems for this plan.

A water system layout was developed following the City's design criteria, guidance from City staff and standards of hydraulic engineering practice. Due to relatively low available pressure in the area, almost all pipe in the conceptual system design are 12-inch or larger in diameter.

WRECO also developed model scenarios depicting conditions in the Meadowview area under existing and proposed conditions using EPANET 2.0. The City's design criteria specify a residual pressure of 20 psi under 3,000 gpm fire flow conditions. The model-predicted pressures in the conceptual Meadowview water system meet City criteria, which is also consistent with Meadowview area existing condition system pressure data.

Pressure in the Meadowview zone under both existing and proposed conditions is insufficient to pressurize fire sprinkler systems.

1 Introduction

1.1 Background

The Development Zone that this report discusses is defined by a roughly 1 mile radius semicircle centered on the existing Meadowview Light Rail Transit (LRT) station in the City of Sacramento, California and bound to the east by the LRT alignment.

This region has been targeted for redevelopment including plans to significantly increase the residential density. Parsons Brinckerhoff Quade & Douglass, Inc (PB) of Sacramento are assisting in the planning stage of the project and PB has contracted with WRECO to develop a conceptual water supply system plan and study for the proposed development.

1.2 Objective

WRECO prepared the conceptual plan and study primarily to determine what measures will be necessary to guarantee sufficient capacity for the proposed development. In addition, the plan was developed to suggest general guidelines for laying out a more finalized water supply system in the future.

1.3 Location

The Meadowview LRT station is located in the southern part of the City of Sacramento adjacent to the LRT tracks whose alignment is roughly north-northwest to south-southeast. Meadowview station location is relatively flat and surrounded by flat terrain for several miles.

1.4 Planned Development

The planned development consists of a mixture of development types. These include areas of single-family homes, townhomes, multi-family residential, mixed-used (i.e., residential with commercial in the ground story), commercial and public space. These areas are all in addition to the LRT station, which includes structured parking transit supportive uses.

1.5 Existing System

The City of Sacramento already has a completely built water supply system surrounding the Meadowview development zone. The area includes larger pipes such as the 12-inch transite main

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along Indian Lane but most of the existing system surrounding the area consists of 6-inch transite laterals and mains with the occasional 8-inch transite main.

1.6 Constraints & Opportunities

Sacramento is a city built on flat land flat city next to the state of California's largest river. Consequently, its water supply system can supply a great volume of water but system pressures are lower than for other comparable cities' water systems.

2 Available Data

Morton Pitalo (2004) was the source for Meadowview area system pressure data. Morton Pitalo (2004) is the product of work done for Morton Pitalo on behalf of Buzz Oates, the development company that owns the northern part of the Meadowview development zone. The table below summarizes the pressure data used in the study.

Meadowview Area System Pressure Data		
Location	Static Pressure (psi)	Design Flow @20 psi (gpm)
Gardendale Road and Loma Verde Way	38	9,900
Meadowview Road near 29th Street	37	5,300
Source: Morton Pitalo (2004)		

PB's cadastral data in the form of Autocad drawing files was the source of elevations for the Meadowview area. HLA's drawings served as the source for types and numbers of proposed new developed units for the purpose of estimating ordinary non-fire flow demands. Cadastral data adapted from the City's water system maps served as the source for the existing system pipe network.

3 Conceptual Design

WRECO developed a conceptual system layout for the Meadowview area. The system layout includes pipe alignments, sizes, and materials and specifies where the new water lines connect to the existing water systems. The system design follows City criteria that all new water systems consist of 8- inch pipe for laterals and 12-inch pipe for mains. The complete system layout is displayed on page 83.

4 Analysis

Model

The hydraulic analysis was performed using EPANET 2.0, available from the US Environmental Protection Agency. The program uses a simultaneous matrix solution algorithm to determine pressure throughout a water supply system based on user-defined data. All pressures were determined based on the Hazen-Williams formulation.

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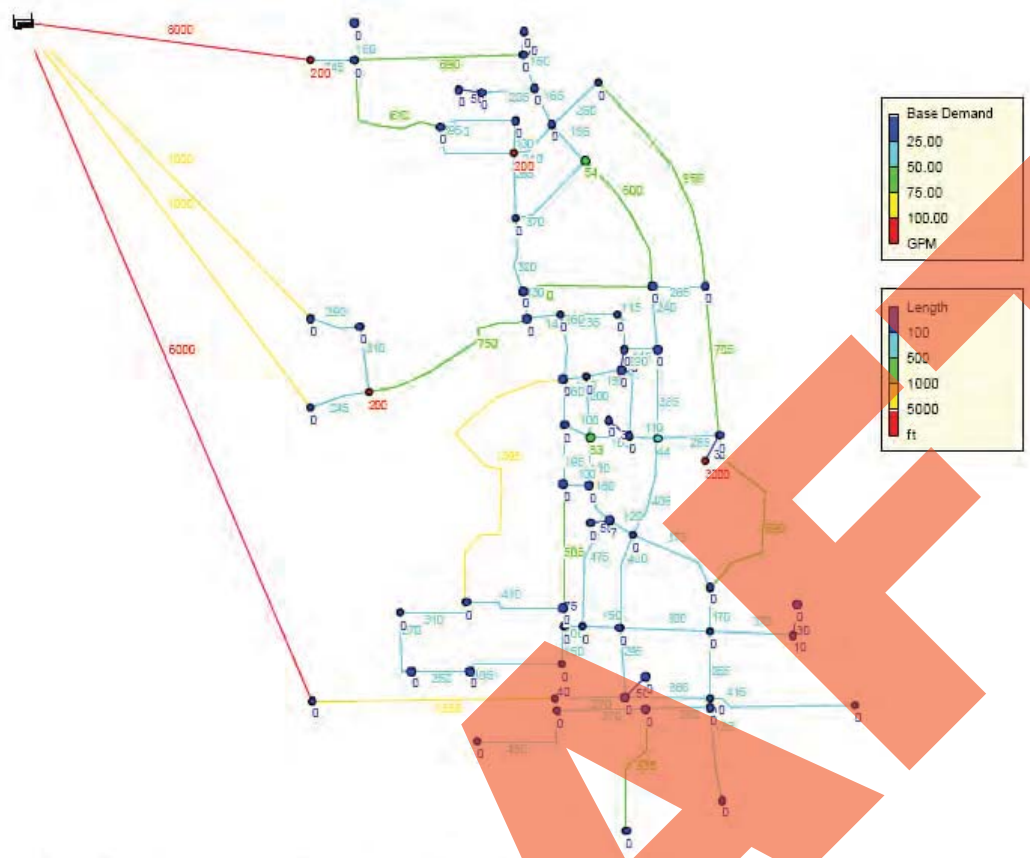

Figure 3. Meadowview EPANET2 Model Pipe Layout

System Layout

Pipe alignments, sizes and materials were reproduced from WRECO's conceptual water system design for the Meadowview area and the existing water system. A Hazen-Williams friction factor of 80 was assumed for the transite pipe making up the existing system and a friction factor of 120 was assumed for new pipe. The value for new pipe is standard for new steel pipe and conservative for new plastic pipe.

The system layout followed general guidelines for laying out water systems, with pipes joined to complete several loops in the area, allowing a large number of flow pathways to any point in the system. In addition, following City staff instructions, all new pipe was either 8-inch or 12-inch.

Model Assumptions

- Pressure drop from main to fire hydrant represented by a 30 foot length of 6-in pipe with a Hazen-Williams coefficient of 120 for all fire flow scenarios.
- Minor losses were not modeled

Regular Demand- Existing Use

Demand for the existing units surrounding the area was estimated by calibration of the existing model networks based on static and fire flow pressure data. Specifically, demands were determined by beginning with assumed values and proceeding towards values that resulted in pressures matching known conditions by trial-and-error. The demands determined for the surrounding area by this method were as follows.

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System Pressure

An examination of the available static and residual pressure distribution indicates that the Meadowview area receives water primarily from a single reservoir to the north. The model scenarios were set up to reflect this situation and the effective reservoir water surface elevations were estimated based on the known system static pressure nearest to the water supplies.

Regular Demand- New Development

The analysis used the City's Design Standard to determine peak regular (non-fire flow) and fire-flow demands for the proposed new development based on the numbers of units and extents of the different development types. The following table summarizes these demands:

Meadowview Area Non-Fire Flow Peak Demand by Sub-Zone					
Density Code	Description	Density	Extent (acres)	Units	Combined Demand (gpm)
R-1	Standard Single Family	Low	16.65	123	53.8
R-2A,B	Multi-Family	Medium	1.97	42	6.6
R-3	Multi-Family	High	13.51	338	52.8
RM X	Residential Mixed Use	Medium/High	16.01	279	43.6
TC	Transportation Corridor		2.17		10.5
Park	Open Space		4.52		0.0
				TOTAL	167.3

The City's Design Standard specifies that the supply system must be able to sustain 3,000 gpm with at least 20 psi of residual pressure in areas with high residential density or commercial development and 2,000 gpm for areas of low density residential development. The demand corresponding to the appropriate density was placed within each of the sub-zones making up the proposed development, in addition to existing and proposed non-fire demands. Within each zone, several different locations were tested and results were recorded for the lowest predicted residual pressure in each zone.

The zones were as follows.

Meadowview Model Test Locations	
Development Type	Location
LRT Station	Southeast
Single Family Homes	North
Multi-Family Housing	East Central
Townhomes	West Central
Mixed Use Commercial	Southwest

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5 Results

5.1 Water System Layout

The proposed water system layout for the new development zone included 44 new pipe links for the Meadowview zone. The following table summarizes the total pipe lengths by diameter for cost estimation.

Estimated Water System Pipe Length Requirements		
Development Zone	12-inch Pipe	8-inch Pipe
Meadowview	10,390	490

5.2 Model

The City specifies 3,000 gpm with a minimum 20 psi residual pressure for domestic development denser than single family housing and for commercial development. The Meadowview area includes predominantly medium and high density housing and commercial development but does include some single family housing. Furthermore, Meadowview area existing condition pressure data indicated ample flow with limited but sufficient pressure. The model scenarios were then chosen to predict residual pressure at the City-specified fire flows for the zones in question. Table 9 shows the results from these scenarios.

Meadowview Model Results			
Location	Static Pressure (psi)	Fire Flow at 20 psi (gpm)	Residual Pressure (psi)
Southeast	37.6	3,000	23.8
North	37.6	2,000	24.3
East Central	37.6	3,000	23.9
West Central	37.6	3,000	21.7
Southwest	37.6	3,000	22.4

As the table above shows, the model results predict that the proposed water systems in the new development zone will have flows and pressures similar to those under existing conditions. That is, the Meadowview zone will have sufficient flow and pressure throughout. The Meadowview area will not maintain pressure in the range required to pressurize building fire sprinkler systems.

6 Conclusions & Recommendations

Pressure Criteria

The data from Morton Pitalo (2004) for the Meadowview area indicate that the existing system pressure would be sufficient to provide 3,000 gpm at 20 psi, regardless of future development.

The EPANET 2.0 model results indicate residual pressures above 20 psi at all locations in the new system in the Meadowview zone under 2,000 gpm fire flow conditions. The model further indicates that, under 3,000 gpm flow conditions, the Meadowview area will be able to maintain 20 psi or greater residual pressure throughout the system.

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Fire Sprinklers

Pressures in the system will not be sufficiently high to pressurize most fire sprinkler systems. This is inevitable, however, since the existing system, even without further development, cannot provide such the sufficient pressure (40 psi) except under static conditions. City staff indicated that boosting to fire sprinkler system pressure will be left to developers.

References

Morton Pitalo 2004, "Water Supply Study for Meadowview Station, City of Sacramento, Sacramento, California", Morton & Pitalo, Inc ,September, 2004.

Ewart, B., 2004, Memorandum to Ulysses Hillard, "Distribution System Boundary Conditions for Florin Station", dated February 11, 2005.

City of Sacramento 1990, "Design and Procedures Manual and Improvement Standards", City of Sacramento Department of Public Works, September 1 1990.

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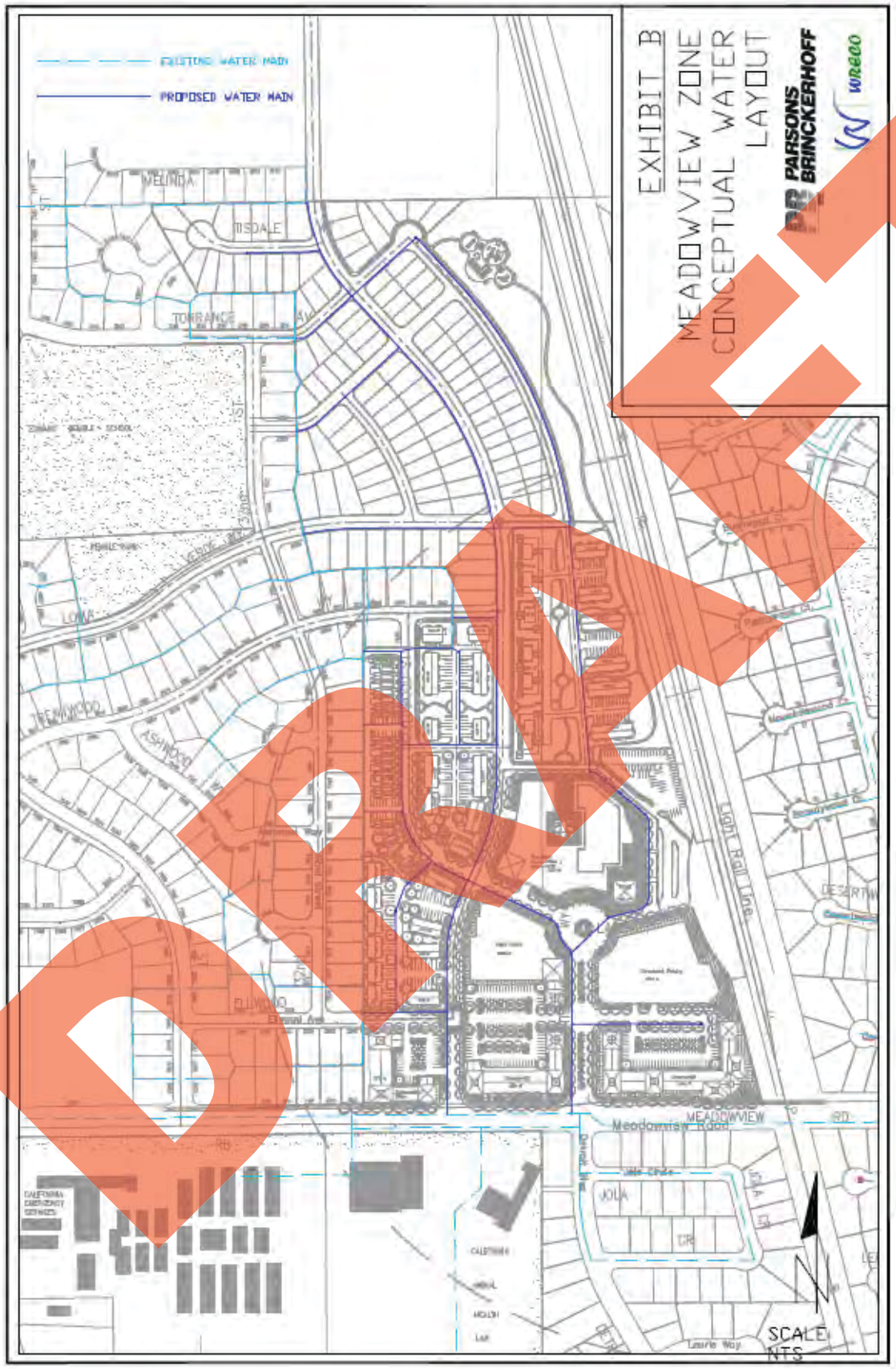
EXISTING WATER MAIN
PROPOSED WATER MAIN
EXHIBIT B
MEADOWVIEW ZONE
CONCEPTUAL WATER
LAYOUT
PARSONS BRINCKERHOFF
WRECO
WELINDA
TISDALE
TORRANCE
LOMA
ASHWOOD
OLIVEWOOD
Light Rail Line
MEADOWVIEW
Meadowview Road
JOLA
SCALE
NTS

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CONCEPTUAL TRAFFIC ANALYSIS SUMMARY

1. Existing Transportation System

Roadway System

Meadowview Road has two lanes in each direction separated by a center left-turn lane in the vicinity of the Meadowview LRT Station. It has a posted speed limit of 40 miles per hour. The segment directly east of the station carries approximately 35,000 vehicles per day.

Traffic signals are situated on Meadowview Road at 24th Street, 29th Street, Station Drive/Detroit Boulevard, and Brookfield Drive. Each signalized intersection currently operates at Level of Service (LOS) C or better during the weekday AM and PM peak hours.

Bicycle/Pedestrian System

Sidewalks and Class II bike lanes (on-street with appropriate signing and striping) exist on both sides of Meadowview Road in the vicinity of the Meadowview Station. The signalized Meadowview Road/Station Drive/Detroit Boulevard intersection has push-button crosswalks on all approaches.

Transit System

The Meadowview LRT Station is currently the terminus of the Southline light rail service. An estimated 4,000 boardings and alightings occur at this station each weekday. Six bus routes stop at the station en-route to various destinations such as Sacramento City College, Florin Mall, Cosumnes River College, Kaiser and Methodist Hospitals, and downtown Sacramento.

Transit Parking

The station currently has 690 parking spaces. Regional Transit provided parking demand information for January through June 2004. During an average weekday, 60 percent of the spaces were occupied. During the busiest weekday (June 15, 2004), 72 percent of the spaces were occupied.

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2. Meadowview TOD Travel Characteristics

Trip Generation

We estimated the weekday AM and PM peak hour vehicular trip generation of the proposed land uses using the following four-step process:

- Step 1 – Develop Initial Trip Generation Estimates Using ITE Trip Generation
- Step 2 – Develop Estimates of Internal Trip-Making and Pass-By Trips
- Step 3 – Develop Estimates of Transit (Light Rail & Bus) Mode Share
- Step 4 – Subtract Internal and Transit Trips from Gross Trips to Determine External Vehicle Trips

The procedure for estimating internal trip-making was based on data published in the Trip Generation Handbook (ITE, 2001) and research performed by Fehr & Peers on the effects of changes in project density, diversity, and design (3D's) on vehicle trips. The procedure for estimating transit mode share is based on data published in *Travel Characteristics of Transit-Oriented Development in California* (Lund, Cervero, Willson, 2003). The following summarizes the project's trip generation characteristics:

	AM Peak Hour	PM Peak Hour
Gross Trips	950	1,850
Internal Trips (25%)	-240	-450
Pass-By Retail Trips[1]	-30	-200
Transit Trips[2]	-110	-200
External Vehicle Trips	570	970

Trip Distribution

We estimated the expected distribution of trips onto the surrounding roadway system based on existing travel patterns and complementary land uses. The following distribution percentages were assumed for the purposes of this study:

Direction	Percentage
To/From the East on Meadowview Road	70%
To/From the West on Meadowview Road	15%
To/From the North on 29th Street	15%

3. Traffic Forecasts/Operations Analysis

Our analysis of the Meadowview Station TOD's potential impacts and infrastructure needs focused on the following four intersections along Meadowview Road:

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[1] 10% of AM peak hour and 25% of PM peak hour trips by retail uses assumed to be "pass-by".
[2] Transit mode share is 20% for retail/public uses, 15% for office, and 10-12% for residential.

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- Meadowview Road/29th Street
- Meadowview Road/Station Drive/Detroit Boulevard
- Meadowview Road/Mack Road/Brookfield Drive
- Meadowview Road/New Project Access (future)

Since the project would likely be constructed over a number of years, an "existing plus project" analysis would not be meaningful. Instead, we analyzed traffic operations under cumulative (2025) conditions.

Attached are figures that display the existing peak hour traffic volumes at each intersection. Also attached are the cumulative forecasts, without and with the Meadowview Station TOD. The cumulative forecasts were developed by adding the increment in traffic growth projected between the base year and 2025 versions of the SACMET regional travel demand model to the existing volumes. Traffic generated by the Meadowview Station TOD was then added to the cumulative background volumes based on the trip generation and distribution assumptions described above and the proposed accesses. Since Meadowview Station will not be the terminus of the Southline in 2025, our forecasts include fewer auto trips (than occurs currently) to/from the station.

Table 1 summarizes the existing and cumulative average delay and LOS at each intersection.

Table 1
Intersection Operations

Intersection	Traffic Control	AM (PM) Peak Hour					
		Existing Conditions		Cumulative Conditions without Florin Station TOD		Cumulative Conditions with Florin Station TOD	
		Average Delay	LOS	Average Delay	LOS	Average Delay	LOS
Meadowview Road/29th Street	Traffic Signal	10 (15) sec/veh	B (B)	16 (15)	B (B)	16 (16)	B (B)
Meadowview Road/Station Drive/Detroit Boulevard	Traffic Signal	14 (28) sec/veh	B (C)	24 (32)	C (C)	26 (53)	C (D)
Meadowview Road/Mack Road/Brookfield Drive	Traffic Signal	25 (25) sec/veh	C (C)	30 (27)	C (C)	41 (35)	D (C)

Table 1 shows that traffic from the Meadowview Station TOD would cause cumulative traffic operations to degrade from LOS C to D at the following intersections:

- Meadowview Road/Station Drive/Detroit Boulevard (PM peak hour); and
- Meadowview Road/Mack Road/Brookfield Drive (AM peak hour).

These would be considered significant impacts according to the City of Sacramento *Revised Guidelines for the Preparation of Traffic Impact Analysis Study (January 2002)*. Since right-of-way is limited in the vicinity of both intersections, it is unlikely that feasible mitigations could be identified to restore operations to LOS C.

It should be noted that the Meadowview Road/Station Drive/Detroit Boulevard intersection would operate at the cusp between LOS D and E under cumulative conditions with the TOD. If

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the levels of internal trip-making and transit usage assumed in this study are not realized, then operations would likely worsen to LOS E or F.

4. Project Access Considerations

The following describes some of the key issues relating to access to the Meadowview Station TOD.

Meadowview Road becomes very congested in the cumulative condition.

This street currently carries approximately 35,000 ADT near the station. This volume is expected to increase to 47,000 ADT by 2025, which is near the capacity of a four-lane arterial. As a result of the anticipated congestion, motorists will incur significant delays entering/exiting the TOD. However, the congestion may encourage more TOD patrons, residents, and workers to use transit versus automobile for their travel.

Left-turns from the westerly project access will be difficult to perform during peak hours. The amount of through traffic projected on Meadowview Road during peak hours will leave a scarcity of adequate gaps for motorists to turn left out of the westerly project driveway. The presence of a center left-turn lane at the driveway and traffic signals at 29th Street and Station Drive are beneficial. It is likely that the majority of left-turns out of the TOD will occur from the signalized Station Drive intersection. It may be worthwhile to consider prohibiting outbound left-turns from this driveway, which is situated about 400 feet west of the signalized Station Drive entry.

Project traffic will leak into neighborhoods to the west of the site.

Some project trips destined to/from the west (on Meadowview Road) or north (on 29th Street) are likely to use existing neighborhood streets such as Ellwood Avenue, Loma Verde Way, Trentwood Way, and Torrance Avenue in addition to 29th Street. Traffic calming devices (15 mph undulations) presently exist on 29th Street and Loma Verde Way. Additional measures may be necessary on streets such as Torrance Avenue and Trentwood Way.

5. Internal Circulation Considerations

The Meadowview Station TOD site plan is still evolving and likely to change. Therefore, our evaluation of internal circulation focuses primarily on the core internal roadways, pedestrian linkages, and bus routes. More detailed aspects of the TOD such as the locations of sidewalks, open landscaped areas/shading, internal bicycle connections, ADA elements and compliance, parking garage access(es), and other design features should be evaluated as the site plan becomes more defined.

Attached is an illustration of our recommended internal circulation improvements. This illustration shows the access plan from Meadowview Road, internal street cross-sections, crosswalk locations, and on-site traffic control. Buses would use the signalized Station Drive entrance from Meadowview Road to access the dropoff/ pick-up area adjacent to the platform. An on- or off-street bicycle facility is recommended for Station Drive. The three-legged traffic circle at the terminus of Station Drive would need to be designed with splitter islands (to prevent wrong-way travel) and perhaps a mountable apron to accommodate truck and bus turning movements.

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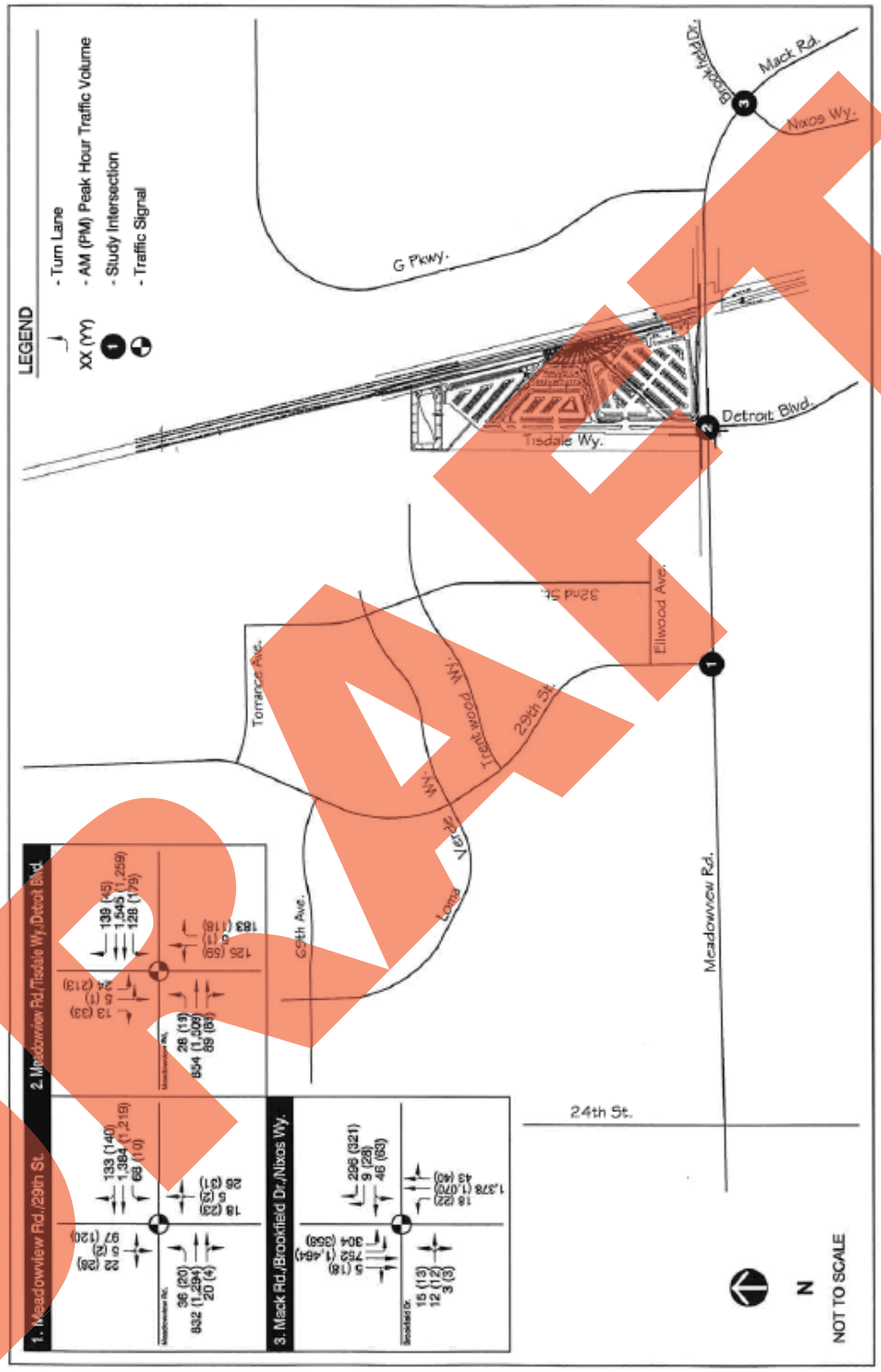

PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - EXISTING CONDITIONS

FIGURE 1

FEHR & PEERS
TRANSPORTATION CONSULTANTS

Jul 06, 2005 MJC
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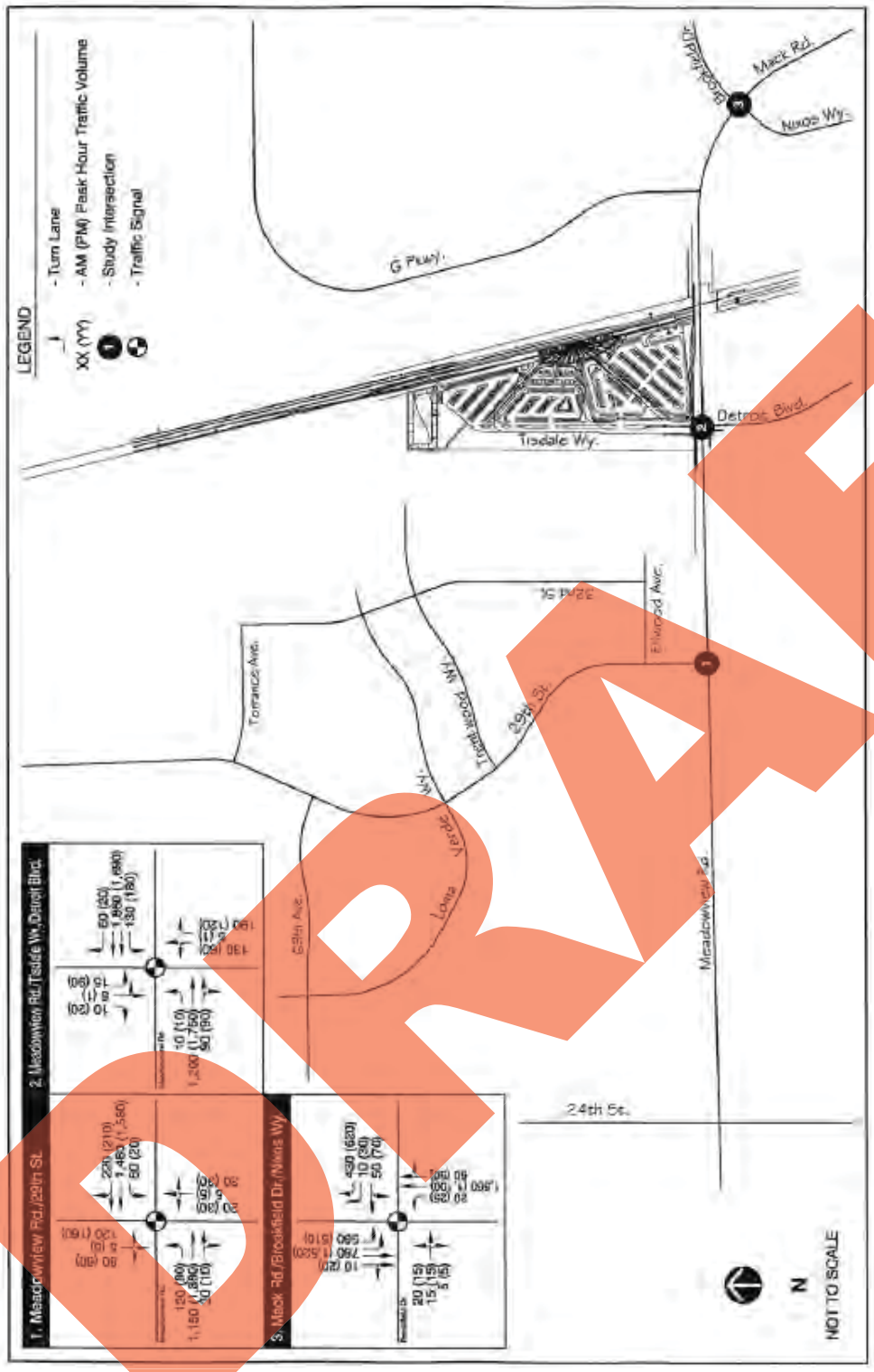

PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - CUMULATIVE NO PROJECT CONDITIONS

FIGURE 2

FEHR & PEERS
TRANSPORTATION CONSULTANTS

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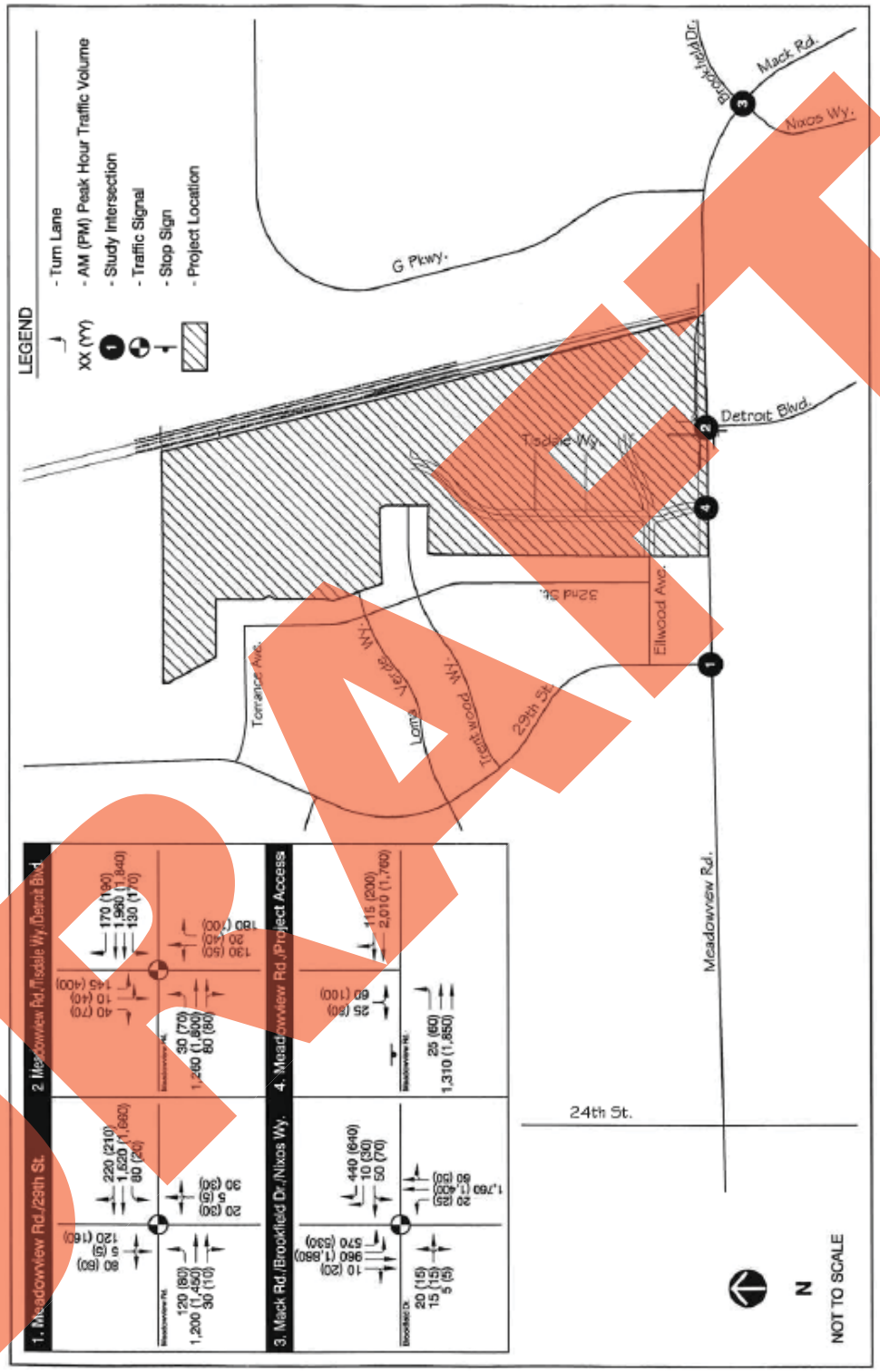

PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - CUMULATIVE CONDITIONS WITH MEADOWVIEW STATION TOD

FIGURE 3

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