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## Appendix - Section 6

# Transportation Infrastructure Memo and Cost Estimates

# Technical Memorandum



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**To:** Mandi Roberts  
**From:** Mark Cole  
**Copies:**  
**Date:** January 28, 2009  
**Subject:** Burien NERA Redevelopment Conceptual Level  
Cost Estimate  
**Project** 31235  
**No.:**

The following memorandum is a summary of projected infrastructure improvement costs to support planned development of the study area. Improvement costs for significant infrastructure elements were developed based on creating “pad-ready” sites for planned onsite improvements of the various subareas, as indicated in the conceptual overlay. Infrastructure improvement costs were estimated for the following elements:

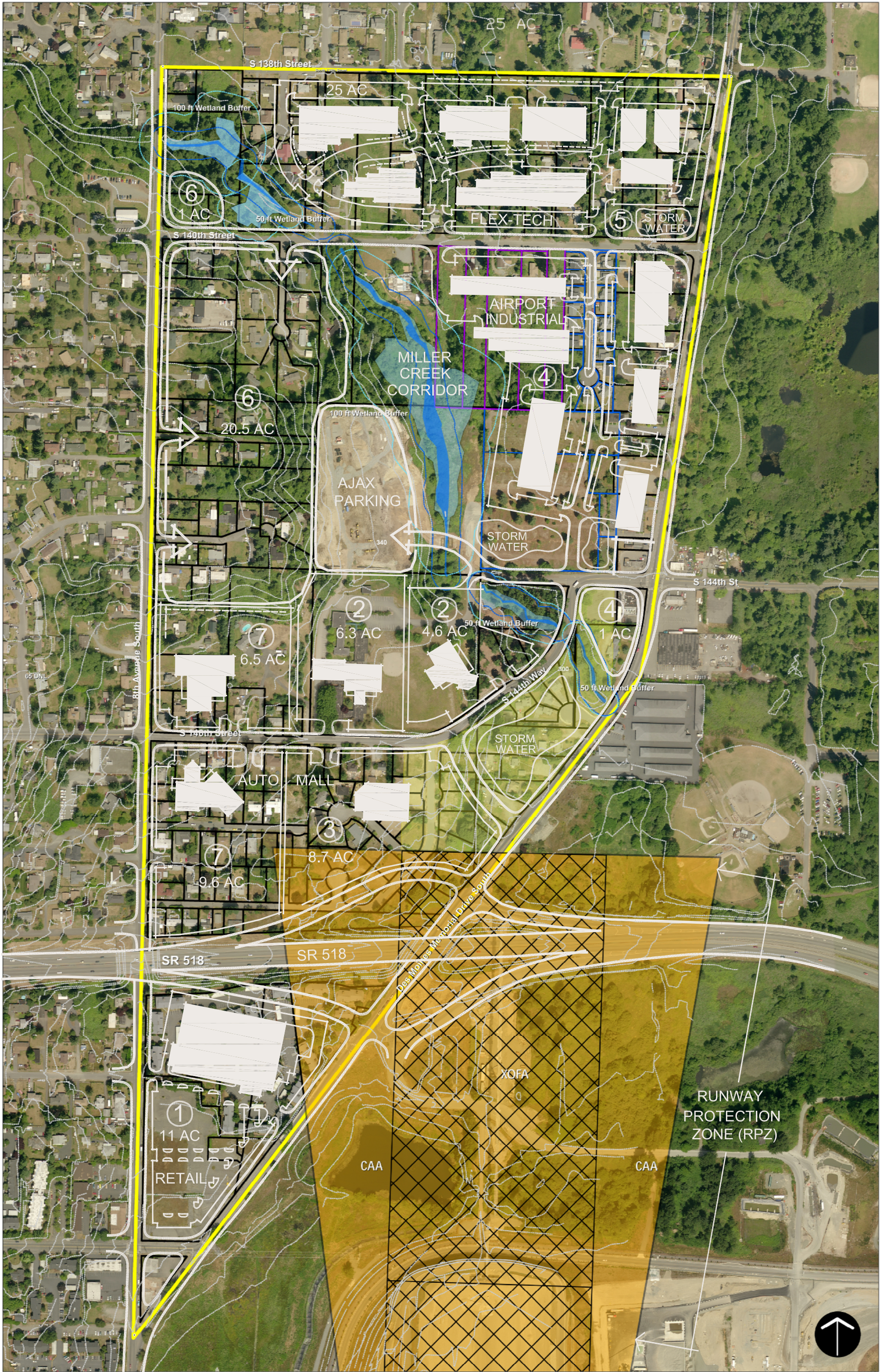
- Reconstruction of existing perimeter and planned interior streets to City standard
- Water and sanitary sewer main upgrades and extensions within the study area
- Demolition and rough grading to form subarea pad sites
- Potential stormwater treatment/detention regional facility
- Facility upgrade allowance of power, natural gas, and telecommunications facilities

Costs of each infrastructure element are identified into logical improvement projects that correspond to development of one or more subareas. Project costs were developed based on estimating construction costs for the significant components of construction and applying an appropriate contingency. Proportionate costs of individual projects have been assigned to seven subareas based on proximity and nature of the required infrastructure project; see Figure 1.

## Basis of Cost Estimates

### Street Improvements

Improvement costs for existing perimeter and planned interior streets reflect full reconstruction to City standard. Improvements are identified into logical projects that correspond to development of one or more subareas. Construction costs are based on estimated quantities using representative unit costs on significant construction elements and include curb and gutter, sidewalk, pavement reconstruction/widening, stormwater collection and treatment/detention facilities, and traffic



Disclaimer: The information shown in this map is assembled from public information. System data is provided from local government and private agencies. Data cannot guarantee the accuracy of this data.

**Legend**

- NERA Boundary
- Burien Parcels
- 10' Elevation Contours
- Miller Creek
- Miller Creek 50 Foot Buffer
- Miller Creek Wetland
- Miller Creek Wetland Buffer

**Aviation Constraints**

- Approach Transition Zone (ATZ) - Airport compatible uses
- Controlled Activity Area (CAA) - Passive recreation (no bird attraction)
- Double Extended Object Free Area (XXOFA) - Located north of XOFA
- Non-Developable Land - Port to keep vacant or use for parking
- Decibel Level Contour

0' 50' 100' 200' 1 inch equals 100 feet

- XXOFA Airport Funds - Developable for compatible uses
- XXOFA Developable - Purchased w/Fed funds to develop into compatible uses
- Extended Object Free Area (XOFA) - No Structures



signal/illumination. Costs for traffic signal modifications and/or installation have been included along 8<sup>th</sup> Avenue South at the intersections of South 146<sup>th</sup> Street, and South 140<sup>th</sup> Street and along Des Moines Memorial Drive at 8<sup>th</sup> Avenue South, 11<sup>th</sup> Avenue South connection, South 144<sup>th</sup> Street, and South 140<sup>th</sup> Street.

A construction contingency of 35% has been included to reflect Washington State sales tax, mobilization, and other non-identified construction items. Project design, environmental permitting, and construction management costs have been estimated at 30% of construction.

Costs do not include improvements to the SR 518 interchange at Des Moines Memorial Drive and are being estimated separately by the Washington State Department of Transportation.

### **Water Improvements**

Improvement costs for water main are based on system extensions and estimated line size upgrades along existing perimeter and planned interior streets. Improvements are identified into logical projects that correspond to development of one or more subareas. Construction costs are based on estimated quantities using representative unit costs on significant construction elements and include line installation with appurtenances, and removal and/or abandonment of existing applicable lines.

A construction contingency of 30% has been included to reflect Washington State sales tax, mobilization, and other non-identified construction items. Project design, environmental permitting, and construction management costs have been estimated at 25% of construction.

### **Sanitary Sewer Improvements**

Improvement costs for sanitary sewers are based on system extension upgrades to existing lines for service coverage to each subarea. Improvements are identified into logical projects that correspond to development of one or more subareas. Construction costs are based on estimated quantities using representative unit costs on significant construction elements and include sewer main installation with manhole and other appurtenances, and removal and/or abandonment of existing applicable mains.

A construction contingency of 30% has been included to reflect Washington State sales tax, mobilization, and other non-identified construction items. Project design, environmental permitting, and construction management costs have been estimated at 25% of construction.

### **Site Demolition and Rough Grading**

Site demolition and rough grading costs represent the cost to prepare individual subareas to “pad-ready” sites for development improvements. Demolition and grading is identified into logical projects that correspond to development of one or more subareas. Construction costs are based on

estimated unit costs on significant construction elements and include demolition and disposal of all building and other surface obstruction, and rough grading of subareas to create pad site locations.

A construction contingency of 35% has been included to reflect Washington State sales tax, mobilization, and other non-identified construction items. Project design, environmental permitting, and construction management costs have been estimated at 30% of construction.

### **Stormwater Facilities**

Stormwater facility improvements represent costs for a possible regional stormwater treatment/detention facility to service a portion of the study area. Contributing service area is limited to a facility that could be accommodated in the identified area adjacent to Miller Creek near Des Moines Memorial Drive. Costs are based on a two-acre facility that will accommodate stormwater runoff from approximately 40 areas of the study area. Collection conveyance piping cost is based on regional service to subareas 4 and 5. Construction costs are based on estimated quantities using representative unit costs on significant construction elements and include earthwork for an above-ground water quality and detention facility; control structures and facility piping; and collection conveyance piping.

A construction contingency of 35% has been included to reflect Washington State sales tax, mobilization, and other non-identified construction items. Project design, environmental permitting, and construction management costs have been estimated at 30% of construction.

### **Power, Natural Gas, and Telecommunications**

Estimated costs for existing facility upgrades to power, natural gas, and telecommunications are undefined; coordination with applicable utility agencies continues in an effort to further understand facility upgrades, requirements, and costs. However, preliminary discussions with Seattle City Light indicate that significant electrical facility upgrades and improvements are required to service the study area. An allowance has been included.

Table I Estimated Infrastructure Project Costs				
No.	Project	Limits	Length (feet)	Project Cost
<b>ROADWAY PROJECTS</b>				
<b>R-1</b>	<b>8<sup>th</sup> Avenue S. Phase 1 Improvement Project</b>			
R-1a	8 <sup>th</sup> Avenue S.	Des Moines Memorial Drive to S. 146 <sup>th</sup> Street	2,500	\$4,475,250
R-1b	S. 152 <sup>nd</sup> Street	8 <sup>th</sup> Avenue S. to Des Moines Memorial Drive	300	\$445,014
<b>R-2</b>	<b>8<sup>th</sup> Avenue S. Phase II Improvement Project</b>			

Table I Estimated Infrastructure Project Costs				
No.	Project	Limits	Length (feet)	Project Cost
	8 <sup>th</sup> Avenue S.	S. 146 <sup>th</sup> Street to S. 140 <sup>th</sup> Street	2,000	\$3,667,950
<b>R-3</b>	<b>8th Avenue S. Phase III Improvement Project</b>			
	8 <sup>th</sup> Avenue S.	S. 140 <sup>th</sup> Street to S. 138 <sup>th</sup> Street	700	\$1,437,345
<b>R-4</b>	<b>Des Moines Memorial Drive, Phase I</b>			
	Des Moines Memorial Drive	8 <sup>th</sup> Avenue S. to S. 144 <sup>th</sup> Street	3,500	\$4,576,163
<b>R-5</b>	<b>Des Moines Memorial Drive, Phase II</b>			
	Des Moines Memorial Drive	S. 144 <sup>th</sup> Street To S. 138 <sup>th</sup> Street	2,000	\$2,614,950
<b>R-6</b>	<b>S. 140th Street</b>			
	S. 140 <sup>th</sup> Street	8 <sup>th</sup> Avenue S. to Des Moines Memorial Drive	2,200	\$3,715,686
<b>R-7</b>	<b>S. 144th Street</b>			
	S. 144 <sup>th</sup> Street	Des Moines Memorial Drive to Miller Creek Crossing	700	\$1,138,995
<b>R-8</b>	<b>S. 146<sup>th</sup>/144<sup>th</sup> Way Improvement Project</b>			
R-8a	S. 146 <sup>th</sup> Street	8 <sup>th</sup> Avenue S. to S. 144 <sup>th</sup> Way	1,200	\$2,165,670
R-8b	S. 146 <sup>th</sup> /D-M Drive Connector (new)	S. 146 <sup>th</sup> Street to Des Moines Memorial Drive	500	\$1,443,488
R-8c	S. 144 <sup>th</sup> Way	S. 146 <sup>th</sup> Street to S. 144 <sup>th</sup> Street	800	\$1,809,405
<b>Subtotal Roadway Projects</b>				<b>\$27,489,916</b>
<b>WATER MAIN IMPROVEMENT PROJECTS</b>				
W-1	S. 140th Street Water Main Improvements	8 <sup>th</sup> Avenue S. to Des Moines Memorial Drive	2,200	\$559,000
W-2	S. 146 <sup>th</sup> /144 <sup>th</sup> Way Water Main Improvements	8 <sup>th</sup> Avenue S. to Des Moines Memorial Drive	2,900	\$703,625
W-3	Des Moines Memorial Drive Water Main Improvements	8 <sup>th</sup> Avenue S. to S. 146 <sup>th</sup> Street	3,000	\$625,625
W-4	8 <sup>th</sup> Avenue Existing Water Main Upgrades	Des Moines Memorial Drive to S. 140 <sup>th</sup> Street		\$365,625
<b>Subtotal Water Main Projects</b>				<b>\$2,253,875</b>
<b>SANITARY SEWER IMPROVEMENTS</b>				
S-1	S. 140 <sup>th</sup> Street Sewer Main Extension	Existing 18" Main to 12 <sup>th</sup> Place S.	2,200	\$1,348,750
S-2	Subarea 3 & Sewer Extension	Existing 18" Main to S. 146 <sup>th</sup> Street	2,500	\$1,528,313
S-3	Existing 18" Trunk Sewer Rehabilitation	S. 140 <sup>th</sup> Street to Des Moines Memorial Drive	2,200	\$682,500
<b>Subtotal Sanitary Sewer Projects</b>				<b>\$3,559,563</b>

Table I Estimated Infrastructure Project Costs				
No.	Project	Limits	Length (feet)	Project Cost
<b>SITE DEMOLITION AND ROUGH GRADING</b>				
SG-1	Subareas 7 (north of S. 146 <sup>th</sup> ) and 2	8 <sup>th</sup> Avenue S. to Miller Creek		\$1,484,375
SG-2	Subareas 7 (south of S. 146 <sup>th</sup> ) and 3	8 <sup>th</sup> Avenue S. to Miller Creek		\$3,398,438
SG-3	Subarea 4	S. 144 <sup>th</sup> Street to S. 140 <sup>th</sup> Street		\$3,296,875
SG-4	Subarea 5	Miller Creek to Des Moines Memorial Drive		\$2,226,563
SG-5	Subarea 1	8 <sup>th</sup> Avenue S. to Des Moines Memorial Drive		\$1,250,000
<b>Subtotal Site Demolition/Rough Grading Projects</b>				<b>\$11,656,251</b>
<b>REGIONAL STORMWATER TREATMENT/DETENTION FACILITIES</b>				
<b>Subtotal Regional Stormwater Treatment/Retention Facilities Projects</b>				<b>\$1,676,025</b>
<b>POWER, NATURAL GAS, AND TELECOMMUNICATIONS (ALLOWANCE)</b>				
<b>Subtotal Power, Natural Gas, and Telecommunications Allowance</b>				<b>\$3,500,000</b>
<b>TOTAL</b>				<b>\$50,135,630</b>

**Table 2  
Proportionate Subarea Infrastructure Costs**

No.	Subarea 1		Subarea 2		Subarea 3		Subarea 4		Subarea 5		Subarea 6		Subarea 7	
	% of project	Cost	% of project	Cost	% of project	Cost	% of project	Cost	% of project	Cost	% of project	Cost	% of project	Cost
<b>ROADWAY PROJECTS</b>														
R-1a	50%	\$2,237,625											50%	\$2,237,625
R-1b	100%	\$445,014												
R-2											75%	\$2,750,963	25%	\$916,988
R-3											100%	\$1,437,345		
R-4	50%	\$2,288,082					50%	\$2,288,082						
R-5							60%	\$1,568,970	40%	\$1,045,980				
R-6							40%	\$1,486,274	50%	\$1,857,843	10%	\$371,569		
R-7							100%	\$1,138,995						
R-8a			25%	\$541,418	25%	\$541,418							50%	\$1,082,835
R-8b					100%	\$1,143,488								
R-8c			100%	\$1,809,405										
<b>Sub-total</b>		<b>\$4,970,721</b>		<b>\$2,350,721</b>		<b>\$1,984,906</b>		<b>\$6,482,321</b>		<b>\$2,903,823</b>		<b>\$4,559,876</b>		<b>\$4,237,448</b>
<b>WATER MAIN IMPROVEMENT PROJECTS</b>														
W-1							40%	\$223,600	50%	279,500	10%	55,900		
W-2			50%	\$351,813	25%	\$175,906							25%	\$175,906
W-3	75%	\$469,219					25%	\$156,406						
W-4											50%	\$182,813	50%	\$182,813
<b>Sub-total</b>		<b>\$469,219</b>		<b>\$351,813</b>		<b>\$175,906</b>		<b>\$380,006</b>		<b>\$279,500</b>		<b>\$238,713</b>		<b>\$358,719</b>
<b>SANITARY SEWER IMPROVEMENTS</b>														
S-1							50%	\$674,375	50%	674,375				
S-2					50%	\$764,157							50%	\$764,157
S-3	15%	\$102,375	15%	\$102,375	15%	102,375	15%	\$102,375	15%	\$102,375	10%	68,250	15%	\$102,375
<b>Sub-total</b>		<b>\$102,375</b>		<b>\$102,375</b>		<b>\$866,532</b>		<b>\$776,750</b>		<b>\$776,750</b>		<b>\$68,250</b>		<b>\$866,532</b>
<b>SITE DEMOLITION AND ROUGH GRADING</b>														
SG-1			50%	\$742,188									50%	\$742,188
SG-2					50%	\$1,699,219							50%	\$1,699,219

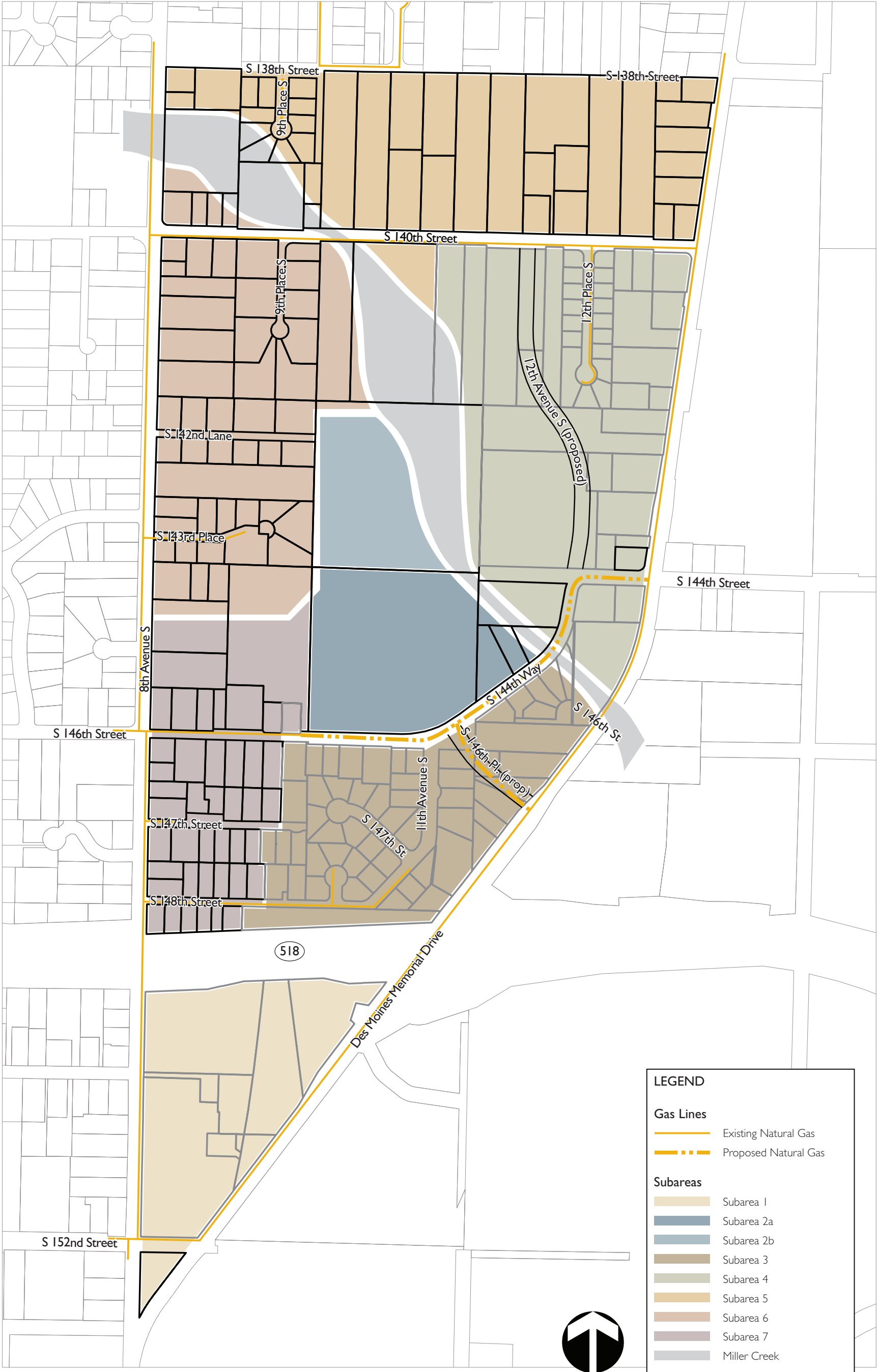


**Table 2  
Proportionate Subarea Infrastructure Costs**

No.	Subarea 1		Subarea 2		Subarea 3		Subarea 4		Subarea 5		Subarea 6		Subarea 7	
SG-3							100%	\$3,296,875						
SG-4									100%	\$2,226,563				
SG-5	100%	\$1,250,000												
<b>Sub-total</b>		<b>\$1,250,000</b>		<b>\$742,188</b>		<b>\$1,699,219</b>		<b>\$3,296,875</b>		<b>\$2,226,563</b>				<b>\$2,441,407</b>
<b>REGIONAL STORMWATER TREATMENT/DETENTION FACILITIES</b>														
							50%	\$838,013	50%	\$838,013				
<b>Sub-total</b>								<b>\$838,013</b>		<b>\$838,013</b>				
<b>POWER, NATURAL GAS, AND TELECOMMUNICATIONS (ALLOWANCE)</b>														
	15%	\$525,000	15%	\$525,000	15%	\$525,000	15%	\$525,000	15%	\$525,000	10%	\$350,000	15%	\$525,000
<b>Sub-total</b>		<b>\$525,000</b>		<b>\$525,000</b>		<b>\$525,000</b>		<b>\$525,000</b>		<b>\$525,000</b>		<b>\$350,000</b>		<b>\$525,000</b>
<b>TOTAL</b>		<b>\$7,317,314</b>		<b>\$4,072,198</b>		<b>\$5,251,562</b>		<b>\$12,298,965</b>		<b>\$7,549,649</b>		<b>\$5,216,839</b>		<b>\$8,429,104</b>

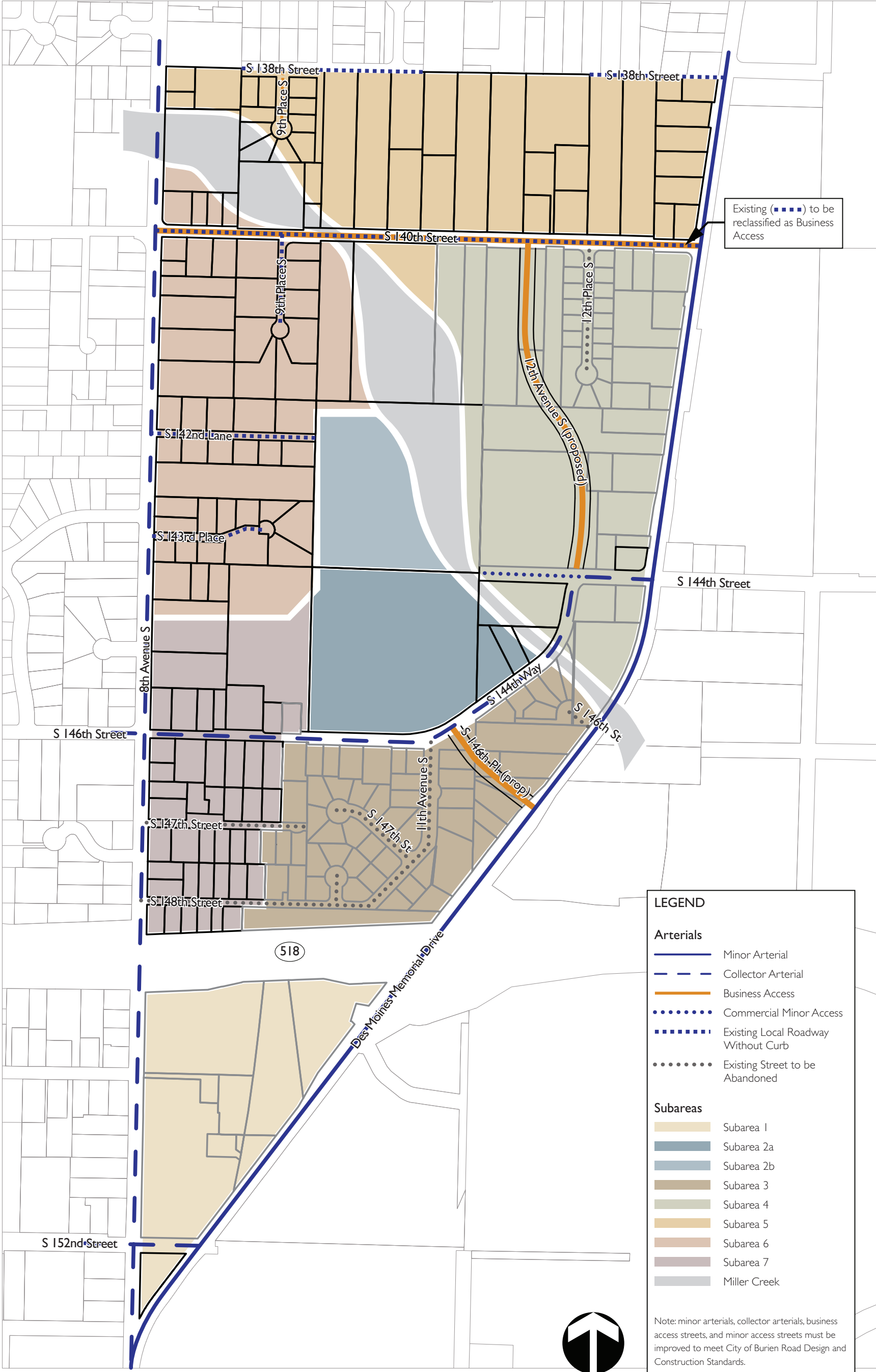
# NERA Infrastructure Map

Existing and Proposed Natural Gas



# NERA Infrastructure Map

Existing and Proposed Roadways



Existing (■■■■) to be reclassified as Business Access

**LEGEND**

**Arterials**

- Minor Arterial
- - - Collector Arterial
- Business Access
- ..... Commercial Minor Access
- Existing Local Roadway Without Curb
- ..... Existing Street to be Abandoned

**Subareas**

- Subarea 1
- Subarea 2a
- Subarea 2b
- Subarea 3
- Subarea 4
- Subarea 5
- Subarea 6
- Subarea 7
- Miller Creek

Note: minor arterials, collector arterials, business access streets, and minor access streets must be improved to meet City of Burien Road Design and Construction Standards.



# NERA Infrastructure Map

Existing and Proposed Water and Sanitary Sewer

