Seattle Children's Hospital

Major Institution Master Plan

Final Environmental Impact Statement

Date of Issue: November 10, 2008

City of Seattle
Department of Planning and Development

The intent and purpose of this Final Environmental Impact Statement is to satisfy the procedural requirements of the State Environmental Policy Act (RCW 43.21c) and City Ordinance 114057. This document is not an authorization for an action, nor does it constitute a decision or a recommendation for an action; in its final form it will accompany the final decision on the proposal.

Final Environmental Impact Statement

for

Seattle Children's Hospital
Major Institution Master Plan

Master Use Permit Application No. 3007521

City of Seattle
Department of Planning and Development

Prepared in Compliance with the
State Environmental Policy Act of 1971
Chapter 43.21 C, Revised Code of Washington

SEPA Rules, Effective April 4, 1984
Chapter 191-11, Washington Administrative Code

City of Seattle SEPA Ordinance 114057 Seattle Municipal Code Chapter 25.05

Date of Issue: November 10, 2008

Preface

On June 9, 2008, the City of Seattle Department of Planning and Development (DPD) issued a Draft Environmental Impact Statement (DEIS) for the Seattle Children's Hospital (Children's) Major Institution Master Plan (MIMP). The issuance of the DEIS was followed by a 45 day agency and public review period which ended on July 25, 2008. During the review period, DPD conducted a public hearing at 6:00 pm on July 10, 2008 in the Northwest Horticulture Society Hall at the Urban Horticulture Center, 3501 NE 41st Street, Seattle, Washington.

This document is a Final Environmental Impact Statement (FEIS). It fully incorporates the information contained in the DEIS, comments received on the DEIS during the public review period, responses to those comments, and additional information developed in response to comments.

This EIS is the first part of "phased" environmental review that is the programmatic phase followed by the project level phase. To the extent that the environmental effects of individual redevelopment projects are known at this time, this document is also intended to serve as a "project level" EIS. As each part of the Master Plan is more fully designed, DPD will evaluate the impacts of the individual projects against the impacts disclosed in this FEIS. Should the impacts significantly vary from those already disclosed, DPD will determine the extent to which additional environmental review is required.

DPD determined the scope of this document in accordance with the scoping process required by the Seattle SEPA Ordinance (SMC 25.05.408). The required scope addresses those elements of the environment in which the presence or potential for significant adverse impacts were considered to be probable prior to analysis. DPD issued a public notice on August 6, 2007 stating that the project would require an EIS and inviting public and agency comments on the scope of the DEIS. DPD held a public scoping meeting on the evening of August 23, 2007 in the Wright Auditorium at Children's, 4800 Sand Point Way NE, Seattle, Washington. The 30-day comment period ended on September 5, 2007 and was extended to September 17, 2007. DPD received comments from seven organizations and over 250 individuals or households. The majority of the comments were in opposition to the height or size of the planned development. Many also expressed opposition to new entrances to the main campus from either NE 45th Street or NE 50th Street. The letters expressed concerns about potential impacts to traffic, pedestrian safety, noise, land use compatibility, and light and glare, along with potential impacts to drainage, air quality, and local utilities.

Based on scoping comments, DPD determined that the project had the potential to result in adverse impacts on the following elements of the environment: geology, air quality, water, energy and natural resources, noise, hazardous materials, land use, housing, height, bulk and scale (aesthetics/light/glare/shadows), transportation, and public services and utilities. There would also be potential impacts from construction (air quality, noise and transportation). It is not anticipated that there would be a significant adverse impact on other elements of the environment, and these elements are eliminated from detailed study. Summary information on the project's effects on these elements of the environment is provided beginning on page vii.

During the 45 day comment period, DPD received approximately 590 written comments from government agencies, organizations, and individuals. In addition, 66 individuals provided oral comments at the July 10, 2008 public hearing. Of these comments, approximately 83 percent were comments in general favor or opposition to the project, with the majority stating a preference in support. Approximately 110 (17 percent) individuals, organizations or agencies submitted substantive comments.

Of the substantive comments, the more frequent issues raised were (in order of frequent comment): (1) a desire that Children's relocate to a new site; (2) that the proposed alternatives be of lower heights and less square footage; and (3) that Children's demonstrate and obtain a Certificate of Need from the State of Washington before any additional space is approved. Other issues frequently raised were: traffic congestion including traffic from University Village expansion and SR 520 alternatives; the potential loss of the Laurelon Terrace Condominiums; the need for replacement housing; impacts to the Bryant neighborhood from cut-through traffic, off-site parking, loss of views, and potential loss of the redwood trees adjacent to the Burke-Gilman Trail; a desire that Children's build additional hospitals instead of expanding; and that proposed access points to NE 45th Street and NE 50th Street be eliminated from all alternatives. Less frequent comments included: construction and operation noise; construction air quality; Children's purchase of single family homes in the area surrounding the hospital; a request for a Residential Parking Zone to insure that Children's staff, patient families and visitors do not park in the neighborhood; and buffer widths. All comments are included in Appendix E.

This FEIS contains:

- A summary of the EIS including a discussion of impacts and mitigation measures relevant to the alternatives (Section 1);
- A description of the project alternatives (Section 2);
- A description of the affected environment, environmental impacts, mitigation measures and significant unavoidable adverse impacts (Section 3); and
- A complete set of comments received on the DEIS during the agency and public review period along with responses to all written comments and oral comments made during the public hearing (Appendix E).

Text changes to Sections 1 through 6 are denoted by a strike-out and underline format. Text additions are denoted by an underline and a parallel line in the margin. Text exclusions are indicated by a line through the words to be omitted.

Appendix E contains the comment letters and responses with the comment letters and applicable responses occurring in tandem. Each comment is identified with a number in the margin. Responses are coded with the number for the comment to which they refer.

DPD will proceed with this document as a FEIS and will make a recommendation regarding the proposed Major Institution Master Plan no less than seven days following the issuance of this document.

Fact Sheet

Project Title

Seattle Children's Hospital Major Institution Master Plan

Proponent

Seattle Children's Hospital

Location

The proposal is located in northeast Seattle on the 21.7-acre campus of Seattle Children's Hospital (Children's) at 4800 Sand Point Way NE, the Hartmann property at 4575 Sand Point Way NE across from Children's, and the 6.75-acre Laurelon Terrace Condominium site located immediately to the west of Children's and bounded on the south by NE 45th Street, on the west by 40th Avenue NE, and on the northwest by Sand Point Way NE..

Proposed Action

The proposal is to expand Children's to approximately 2.4 million square feet to include 500 – 600 beds, clinic, research, clinical laboratory, and office uses. Depending on the alternative selected, approximately 170,000 square feet of the total expansion could occur at the Hartmann site for office and medical clinic use. Two alternatives include the expansion of the campus to incorporate the Laurelon Terrace site. The proposal includes an increase of parking to approximately 2,570 – 3,100 stalls at Children's and approximately 225 - 530 stalls at Hartmann (depending on alternative selected).

Lead Agency

City of Seattle Department of Planning and Development

Responsible Official:	Diane Sugimura, Director City of Seattle Department of Planning and Development Seattle Municipal Tower, 700 Fifth Avenue, Suite 2000 PO Box 34019, Seattle, WA 98124-4019
Contact Person:	Scott Ringgold, Land Use Planner City of Seattle Department of Planning and Development Seattle Municipal Tower, 700 Fifth Avenue, Suite 2000 PO Box 34019, Seattle, WA 98124-4019 Telephone: (206) 233-3856 Fax: (206) 233-7902

Master Use Permit No.: 3007521

Required Approvals

Preliminary investigation indicates that the following permits and/or approvals could be required for the proposal. Additional permits and/or approvals may be identified during the review process.

State of Washington
Department of Health
- Certificate of Need

Labor & Industries
- Elevator Permits

Puget Sound Clean Air Agency
- Asbestos Survey
- Demolition Permit

City of Seattle
Department of Planning and Development
- Draft and Final EIS Approval
- Major Institution Master Plan
- Rezone
- Master Use Permit
- Exemption from Environmentally Critical Areas (depending on selected alternative and location of construction on Hartmann site)
- Grading Permit/Shoring Permit
- Demolition Permit
- Building Permit
- Mechanical Permits
- Electrical Permits
- Structural Permit
- Certification of Occupancy
- Energy Code Approval
- Drainage Control Plan Review and Approval

Seattle City Light
- Electrical connection

Seattle Department of Transportation
- Vacation of 41st Avenue NE and NE 46th Street between Sand Point Way NE and 40th Avenue NE (if Alternative 7R or 8 is approved)
- Pre-construction roadway condition survey

Seattle Public Utilities
- Water connection
- Sewer connection

Seattle Fire Department
- Fire Code Inspections

Seattle-King County Department of Health
- Plumbing Permits

Date of Issuance of the Final EIS

November 10, 2008

Approximate Date of Action by the City of Seattle

Following the issuance of the Final EIS, the following process will take place:

- DPD's Director and the Citizen Advisory Committee will independently prepare draft reports of their findings and recommendations on the Final Master Plan (anticipated to be in mid-December 2008)

- After review and comment, DPD and the Citizens Advisory Committee will finalize their reports and submit their recommendations to the Hearing Examiner.

- The Hearing Examiner will hold a hearing and will submit a recommendation to the City Council.

- The City Council will take final action on the Hearing Examiner's recommendation within three months of receipt of the recommendation.

It is estimated that City Council action will occur during the summer of 2009.

Additional Environmental Review

No additional environmental review beyond this EIS is anticipated for the proposed action. Depending on the alternative selected, and the timing of individual Master Use permits, a SEPA addendum to this EIS may be required.

Document Availability and Cost

Copies of this EIS have been distributed to agencies and organizations noted in Section 6, Distribution List of this document.

Copies of this document are also available for review at the City of Seattle Department of Planning and Development Public Resource Center, located in Suite 2000 of Seattle Municipal Tower in Downtown Seattle (700 Fifth Avenue) and at the following branches of the Seattle Public Library:

- Central Library (1000 – 4th Avenue)
- North East Branch (6801 – 35th Avenue NE)

A limited number of complimentary copies of this EIS may be obtained from the Department of Planning and Development Public Resource Center while the supply lasts. Additional copies may be purchased for the cost of reproduction.

Information regarding the master plan can be found at: http://masterplan.seattlechildrens.org/

Authors and Principal Contributors to this EIS

The Major Institution Master Plan EIS has been prepared under the direction of the Department of Planning and Development. Research and analysis was provided by the following consulting firms:

URS Corporation (Environmental analysis and document preparation)
1501 4th Avenue, Suite 1400
Seattle, Washington 98101-1616

Transpo Group (Transportation analysis)
11730 118th Avenue NE, Suite 600
Kirkland, Washington 98034-7120

Wyle Aviation Services (Helicopter noise analysis)
128 Maryland Street
El Segundo, California 90245

Zimmer Gunsul Frasca Partnership (Shadow and glare modeling)
925 Fourth Avenue, Suite 2400
Seattle, Washington 98104

Sparling (Construction and operation noise analysis)
720 Olive Way, Suite 1400
Seattle, Washington 98101-1853

Location of Background Data

City of Seattle
Department of Planning and Development
Seattle Municipal Tower, 700 Fifth Avenue, Suite 2000
PO Box 34019

Seattle, WA 98124-4019

Elements of the Environment

The following list of elements of the environment set forth in Chapter 25.05.444 of the Seattle Municipal Code are potential elements that might be included in an EIS. During the scoping period, the Department of Planning and Development evaluated the project's potential adverse impacts on each of these elements of the environment. The items marked "reviewed" are discussed in Chapter 3 of this EIS. These items were identified as a result of the scoping process carried out in compliance with Section 25.05.408 of the Seattle Municipal Code and determined by the Department of Planning and Development to have a potential significant adverse impact on a particular element of the environment. Items marked "not reviewed" have impacts deemed nonsignificant for reasons briefly stated and are not discussed in the EIS. Construction impacts are also discussed in Chapter 3 of this EIS.

I. Natural Environment

(a) Earth

(i)	Geology	Reviewed
(ii)	Soils	Reviewed
(iii)	Topography	Reviewed for Hartmann site
(iv)	Unique physical features	Not reviewed; none exist
(v)	Erosion/enlargement	Reviewed

(b) Air

(i)	Air Quality	Reviewed
(ii)	Odor	Reviewed
(iii)	Climate	Reviewed

(c) Water

(i)	Surface Water Movement, Quantity or Quality	Not reviewed; no surface water on site
(ii)	Runoff/absorption	Reviewed
(iii)	Floods	Not reviewed; not applicable to the site
(iv)	Groundwater	Reviewed
(v)	Public water supply	Reviewed

(d) Plants and Animals

(i)	Habitat	Not reviewed; only usual urban birds can be reasonably expected on site
(ii)	Unique species	Not reviewed; none reasonably expected to exist on site. Bald eagles, no longer listed as an endangered species under the Federal

			Endangered Species Act, are known to nest and feed in the vicinity of the project area. The closest known nest is within the Talaris Conference Center property to the south of the project site. There are buffers associated with eagle nesting sites to prevent disturbances during nesting seasons, however these buffers are entirely within or south of the Talaris property and do not extend north to the Children's property site.
		(iii) Fish or wildlife	Not reviewed; not applicable to the site
	(e) Energy and Natural Resources		
		(i) Amount required/ rate of use/ efficiency	Not reviewed; energy consumption of the proposal (for both construction and operation) is not expected to have an overall impact on the City of Seattle energy supply
		(ii) Source/availability	Reviewed
		(iii) Nonrenewable resources	Not reviewed; the only use of resources would be for normal building materials
		(iv) Conservation and renewable resources	Reviewed
		(v) Scenic resources	Not reviewed; no impact to protected views are anticipated
II.	Built Environment		
	(a) Environmental Health		
		(i) Noise	Reviewed
		(ii) Risk of explosion	Reviewed
		(iii) Releases or potential releases to the environment affecting public health, such as toxic or hazardous materials.	Reviewed
	(b) Land and Shoreline Use		
		(i) Relationship to existing land use plans and to estimated population	Reviewed
		(ii) Housing	Reviewed
		(iii) Light and glare	Reviewed
		(iv) Aesthetics	Reviewed
		(v) Recreation	Not reviewed; not applicable to the site
		(vi) Historic and cultural	Not reviewed; Seattle's SEPA ordinance,

		preservation	SMC 25.05.675 subsection H. requires consideration of the historic significance of older buildings that appear to meet the criteria for designation under the City's landmarks preservation ordinance. With Alternative 7R, there are two properties that would require review and compliance with the nomination requirements, Laurelon Terrace and the Hartmann building. On September 3, 2008, the City's Landmarks Preservation Board voted to deny the designation of the Laurelon Terrace condominiums based on the finding that this property does not meet any of the designation standards of SMC 25.12.350. If Alternative 7R is approved, a similar review review of the Hartmann building would be performed.
	(vii)	Agricultural crops	Not reviewed; not applicable to the site
(c)	Transportation		
	(i)	Transportation systems	Reviewed
	(ii)	Vehicular traffic	Reviewed
	(iii)	Waterborne, Rail	Not reviewed; not applicable to the site
	(iv)	Parking	Reviewed
	(v)	Movement and circulation of people or goods	Reviewed
	(vi)	Traffic hazards	Reviewed
(d)	Public Services and Utilities		
	(i)	Fire	Reviewed
	(ii)	Police	Reviewed
	(iii)	Schools	Not reviewed; proposal will not affect schools
	(iv)	Parks or other recreational facilities	Not reviewed; proposal will not affect existing parks or create an additional demand on nearby parks or recreational facilities
	(v)	Maintenance	Reviewed
	(vi)	Communications	Not reviewed; communication needs will be those typically required for hospital and office use
	(vii)	Water and Storm Water	Reviewed
	(viii)	Sewer and Solid Waste	Reviewed
	(ix)	Other government services or utilities.	Reviewed; electricity (in the Energy section)

Acronyms

ADA	Americans with Disabilities Act
CAC	Citizens Advisory Committee
CIP	Capital Improvement Program
Children's	Seattle Children's Hospital
CO	carbon monoxide
CRA	Community Reporting Area
CSMP	Comprehensive Safety and Mobility Plan
CTR	Commute Trip Reduction
CTS	Comprehensive Transportation Strategy
cu yds	cubic yards
dB	decibel
dBA	A-weighted decibel
DON	Department of Neighborhoods
DPD	Department of Planning and Development
DEIS	Draft EIS
DNL	day-night average sound level
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FEIS	Final EIS
GHG	Greenhouse Gas
GRH	Guaranteed Ride Home
gsf	gross square feet
HOV	high occupancy vehicle
ITS	Intelligent Transportation System
kVA	kilovolt amperes
kW	kilowatt
lbs/day	pounds per day
L-3	Multi-family Residential, Low-Rise 3 with a 30-foot height limit
LDT	Low-rise Duplex/Triplex with a 25-foot height limit
Lmax	instantaneous maximum sound level

LOS	level of service
MBH	million BTU/hour
MIMP	Major Institution Master Plan
MIO	Major Institution Overlay
mph	miles per hour
msl	mean sea level
MUP	Master Use Permit
MUTCD	Manual on Uniform Traffic Control Devices
NOx	nitrogen oxide
$PM_{2.5}$	particulate matter less than 2.5 micrometers in diameter
PM_{10}	particulate matter less than 10 micrometers in diameter
PSCAA	Puget Sound Clean Air Agency
RPZ	Residential Parking Zone
SDOT	Seattle Department of Transportation
SEL	sound exposure level
SEPA	State Environmental Policy Act
sf	square feet
SF 5000	Single-Family Residential with a 30-foot height limit
SMC	Seattle Municipal Code
SOV	single occupancy vehicle
SR	State Route
SRI	solar reflectance index
tcy	total cubic yards
TDM	Transportation Demand Management
TMP	Transportation Management Program
UATAS	University Area Transportation Action Strategy
v/c	volume to capacity
VMS	variable message signs
VOC	volatile organic compound
WAC	Washington Administrative Code
WSDOT	Washington State Department of Transportation

Table of Contents

Fact Sheet i

Acronyms ix

Section 1 - Summary 1-1

1.1 Background and Purpose 1-1
1.1.1 Health Care Needs 1-1
1.2 Site and Site Vicinity 1-2
1.3 Description of Alternatives 1-7
1.4 Summary of Potential Impacts 1-14
1.5 Summary of Potential Mitigation Measures 1-14
1.6 Significant Unavoidable Adverse Impacts 1-14
1.7 Secondary and Cumulative Impacts 1-14

Section 2 - Description of Alternatives 2-1

2.1 Background and Purpose 2-1
2.2 Children's Mission 2-2
2.2.1 Children's Strategic Plan 2-2
2.3 Health Care Needs 2-3
2.3.1 National and Regional Context 2-3
2.3.2 Regional Population Growth 2-4
2.3.3 Facilities Capacity 2-4
2.4 Site and Site Vicinity 2-5
2.5 City of Seattle Permitting 2-6
2.5.1 Zoning 2-6
2.5.2 Major Institution Overlay (MIO) Designation 2-6
2.6 Alternatives 2-7
2.6.1 Alternative 1 – No Build 2-13
2.6.2 Design Elements Common to All Build Alternatives 2-13
2.6.3 Alternative 3 – South Campus Expansion 2-15
2.6.4 Alternative 6 – Modified North Campus Expansion 2-17
2.6.5 Alternative 7R – Expanded Boundary, Early Laurelon Development 2-19
2.6.6 Alternative 8 - Early Laurelon Development Without Hartmann 2-21
2.7 Construction Phasing 2-22
2.7.1 Alternative 1 – No Action 2-22
2.7.2 Alternative 3 2-22
2.7.3 Alternative 6 2-24
2.7.4 Alternative 7R 2-25
2.7.5 Alternative 8 2-27
2.8 Alternatives Considered But Not Advanced 2-29
2.8.1 Alternatives Included In Initial Concept Plan (July 2007) 2-29
2.8.2 Alternatives Included In Preliminary Draft Master Plan (January 2008) 2-29
2.8.3 Alternatives No Longer Under Consideration 2-32

2.9 Benefits and Disadvantages of Delaying Project Implementation 2-34

Section 3 - Environmental Analysis..... 3.1-1

3.1 Geology..... 3.1-1
3.1.1 Affected Environment..... 3.1-1
3.1.2 Impacts..... 3.1-1
3.1.3 Mitigation Measures 3.1-3
3.1.4 Significant Unavoidable Adverse Impacts..... 3.1-4
3.1.5 Secondary and Cumulative Impacts..... 3.1-4

3.2 Air 3.2-1
3.2.1 Affected Environment..... 3.2-1
3.2.2 Impacts..... 3.2-4
3.2.3 Mitigation Measures 3.2-16
3.2.4 Significant Unavoidable Adverse Impacts..... 3.2-17
3.2.5 Secondary and Cumulative Impacts..... 3.2-17

3.3 Water..... 3.3-1
3.3.1 Affected Environment..... 3.3-1
3.3.2 Impacts..... 3.3-2
3.3.3 Mitigation Measures 3.3-3
3.3.4 Significant Unavoidable Adverse Impacts..... 3.3-3
3.3.5 Secondary and Cumulative Impacts..... 3.3-4

3.4 Energy and Natural Resources..... 3.4-1
3.4.1 Affected Environment..... 3.4-1
3.4.2 Impacts..... 3.4-4
3.4.3 Mitigation Measures 3.4-6
3.4.4 Significant Unavoidable Adverse Impacts..... 3.4-6
3.4.5 Secondary and Cumulative Impacts..... 3.4-6

3.5 Noise 3.5-1
3.5.1 Affected Environment..... 3.5-1
3.5.2 Impacts..... 3.5-4
3.5.3 Mitigation Measures 3.5-35
3.5.4 Significant Unavoidable Adverse Impacts..... 3.5-36
3.5.5 Secondary and Cumulative Impacts..... 3.5-36

3.6 Hazardous Materials 3.6-1
3.6.1 Affected Environment..... 3.6-1
3.6.2 Impacts..... 3.6-1
3.6.3 Mitigation Measures 3.6-2
3.6.4 Significant Unavoidable Adverse Impacts..... 3.6-2
3.6.5 Secondary and Cumulative Impacts..... 3.6-2

3.7 Land Use 3.7-1
3.7.1 Affected Environment..... 3.7-1
3.7.2 Impacts..... 3.7-4
3.7.3 Mitigation Measures 3.7-17
3.7.4 Significant Unavoidable Adverse Impacts..... 3.7-17
3.7.5 Secondary and Cumulative Impacts..... 3.7-17

3.8 Housing 3.8-1
3.8.1 Affected Environment 3.8-1
3.8.2 Impacts 3.8-5
3.8.3 Mitigation Measures 3.8-6
3.8.4 Significant Unavoidable Adverse Impacts 3.8-7
3.8.5 Secondary and Cumulative Impacts 3.8-7
3.9 Aesthetics/Light, Glare and Shadows 3.9-1
3.9.1 Affected Environment 3.9-1
3.9.2 Impacts 3.9-3
3.9.3 Mitigation Measures 3.9-14
3.9.4 Significant Unavoidable Adverse Impacts 3.9-14
3.9.5 Secondary and Cumulative Impacts 3.9-15
3.10 Transportation 3.10-1
3.10.1 Street System 3.10-2
3.10.2 Traffic Volumes 3.10-11
3.10.3 Traffic Operations 3.10-14
3.10.4 Traffic Safety 3.10-28
3.10.5 Parking 3.10-29
3.10.6 Non-Motorized Travel – Pedestrian and Bicyclists 3.10-39
3.10.7 Transit and Shuttle Services 3.10-44
3.10.8 Helistop 3.10-47
3.10.9 Phasing and Construction Impacts 3.10-47
3.10.10 Mitigation Measures 3.10-54
3.10.11 Significant Unavoidable Adverse Impacts 3.10-64
3.10.12 Secondary and Cumulative Impacts 3.10-65
3.11 Public Services and Utilities 3.11-1
3.11.1 Affected Environment 3.11-1
3.11.2 Impacts 3.11-4
3.11.3 Mitigation Measures 3.11-5
3.11.4 Significant Unavoidable Adverse Impacts 3.11-6
3.11.5 Secondary and Cumulative Impacts 3.11-6

Section 4 - References 4-1

Section 5 - Glossary 5-1

Section 6 - Final EIS Distribution List 6-1

List of Tables

Table 1-1 Alternatives Proposed in August 2008 Preliminary Final Master Plan and Analyzed in This FEIS 1-9
Table 1-1a Summary Comparison of Existing and Proposed Square Footage 1-13
Table 1-2 Summary of Potential Impacts 1-15
Table 1-3 Summary of Potential Mitigation Measures 1-25
Table 1-4 Summary of Significant Unavoidable Adverse Impacts 1-32
Table 1-5 Summary of Secondary and Cumulative Impacts 1-34
Table 2-1 Alternatives Proposed in August 2008 Preliminary Final Master Plan and Analyzed in This FEIS 2-8

Table 2-1a Summary of Construction Activities of Each Phase for Alternative 3 2-24
Table 2-1b Summary of Construction Activities of Each Phase for Alternative 6 2-25
Table 2-1c Summary of Construction Activities of Each Phase for Alternative 7R.....2-27
Table 2-1d Summary of Construction Activities of Each Phase for Alternative 8 2-29
Table 2-2 Alternatives Proposed in July 2007 Concept Plan 2-30
Table 2-3 Alternatives Proposed in January 2008 Preliminary Draft Master Plan 2-31
Table 3.1-1 Estimated Volume of Excavated Soil 3.1-2
Table 3.2-1 Maximum Annual Boiler Emissions.....3.2-2
Table 3.2-2 Vehicle Emissions from Children's Daily Vehicle Trips 3.2-3
Table 3.2-3 Summary of Construction Activities of Each Phase of Alternative 3.....3.2-5
Table 3.2-4 Summary of Construction Activities of Each Phase of Alternative 6.....3.2-6
Table 3.2-5 Summary of Construction Activities of Each Phase of Alternative 7R 3.2-8
Table 3.2-5a Summary of Construction Activities of Each Phase of Alternative 8.....3.2-9
Table 3.2-6 Estimated Maximum Daily Emissions from Construction of Each Phase of Alternative 3 (lbs/day) 3.2-10
Table 3.2-7 Estimated Maximum Daily Emissions from Construction of Each Phase of Alternative 6 (lbs/day) 3.2-10
Table 3.2-8 Estimated Maximum Daily Emissions from Construction of Each Phase of - Alternative 7R (lbs/day) 3.2-11
Table 3.2-8a Estimated Maximum Daily Emissions from Construction of Each Phase of - Alternative 8 (lbs/day).....3.2-11
Table 3.2-9 Estimated Project Boiler Emissions for Build Alternatives (tons/year).....3.2-12
Table 3.2-10 Estimated Maximum Daily Operations Emissions from Vehicles - Alternative 3 (lbs/day)-.....3.2-13
Table 3.2-11 Estimated Maximum Daily Operations Emissions from Vehicles - Alternative 6 (lbs/day) 3.2-13
Table 3.2-12 Estimated Maximum Daily Operations Emissions from Vehicles - Alternative 7R (lbs/day).....3.2-14
Table 3-12a Estimated Maximum Daily Operations Emissions from Vehicles - Alternative 8 (lbs/day) 3.2-14
Table 3.2-13 Estimated Maximum Daily Emissions from Operation of All Alternatives (Unmitigated) (lbs/day).....3.2-15
Table 3.2.14 Estimated Daily Greenhouse Gas Emissions from Operation of All Alternatives (Unmitigated).....3.2-15
Table 3.4-1 Average Monthly Gas Consumption, July 2006 – July 2007 .....3.4-1
Table 3.4-2 Average Hospital Monthly Electrical Consumption, July 2006 – July 2007.....3.4-2
Table 3.4-3 Average Monthly Electrical Consumption, October 2006 - October 2007 Hartmann Building 3.4-3
Table 3.5-1 Existing Emergency Flight Operations.....3.5-3
Table 3.5-2 Existing Modeled Noise Levels 3.5-4
Table 3.5-3 Seattle Noise Code Maximum Permissible Noise Levels.....3.5-6
Table 3.5-4 Seattle Noise Code Exceedances 3.5-15
Table 3.5-5 Modeled Noise Levels at Temporary Helipad Location 1 for Alternatives 3 and 6...3.5-18
Table 3.5-6 Modeled Noise Levels at Temporary Helipad Location 2 for Alternative 3 or 6.....3.5-20
Table 3.5-7 Modeled Noise Levels at Proposed Helipad Location for Alternative 3 .....3.5-23
Table 3.5-8 Modeled Noise Levels at Proposed Helipad Location for Alternative 6 .....3.5-26
Table 3.5-9 Noise Exposure from Emergency Operations at Alternative 7RA Helipad Location.3.5-29
Table 3.5-10 Noise Exposure from Emergency Operations at Alternative 7RB Helipad Location.3.5-30
Table 3.5-11 Noise Exposure from Emergency Operations at Alternative 8A Helipad Location ...3.5-33
Table 3.5-12 Noise Exposure from Emergency Operations at Alternative 8B Helipad Location ...3.5-34
Table 3.7-1 Comparison of Density 3.7-5

Table 3.7-1a Proposed Change of Use – Comparison of Alternatives....3.7-6
Table 3.7-2 Consistency with Urban Village Policies 3.7-8
Table 3.7-3 Consistency with Citywide Land Use Policies 3.7-9
Table 3.7-4 Consistency with Major Institution Goals and Policies 3.7-9
Table 3.7-5 Existing and Proposed Height Limits 3.7-15
Table 3.8-1 Population, Housing and Income Characteristics 3.8-1
Table 3.8-2 Contract Rent 3.8-3
Table 3.8-3 Hotels Within Ten Miles of Children's Campus 3.8-4
Table 3.8-4 Recreational Vehicle Parks Within Eleven Miles of Children's Campus....3.8-5
Table 3.9-1 Proposed Landscaping Impacts and Proposed Improvements....3.9-4
Table 3.9-2 Estimated Height, Bulk and Scale Impacts of the Alternatives 3.9-5
Table 3.9-3 Estimated Shadow Impacts of the Alternatives 3.9-12
Table 3.10-1 Build Alternatives Key Transportation Characteristics 3.10-1
Table 3.10-2 Existing Person Trips by Mode....3.10-11
Table 3.10-3 Estimated Future Unmitigated and Mitigated Vehicle Trip Generation....3.10-13
Table 3.10-4 Existing (2007) PM Peak Hour Corridor Travel Time and Average Speeds....3.10-17
Table 3.10-5 Comparison of Existing, No-Build (2030), and Build Alternatives Corridor Travel Time and Average Speeds 3.10-19
Table 3.10-6 Summary Comparison of Intersection Impacts....3.10-22
Table 3.10-7 Build Alternatives Access Requirement Summary....3.10-24
Table 3.10-8 Build Alternatives Parking Supply Required by City Code 3.10-33
Table 3.10-9 Build Alternatives Proposed Unmitigated Parking Supply....3.10-36
Table 3.10-10 Future Peak Parking Demand at MIMP Buildout....3.10-38
Table 3.10-11 Build Alternatives Proposed Mitigated Parking Supply 3.10-38
Table 3.10-12 Build Alternatives Forecasted Net New Trips – Unmitigated 3.10-49
Table 3.10-12a Build Alternatives Construction Truck Traffic (Average Maximum Roundtrips) ...3.10-53
Table 3.10-13 Comparison of Existing and Enhanced Transportation Management Programs 3.10-60
Table 3.11-1 Fire Station Resources Near Children's....3.11-1
Table 3.11-2 Summary of 2006 Part 1 Offenses Around Children's 3.11-2

List of Figures

Figure 1-1 Site Vicinity 1-4
Figure 1-2 Hospital Campus 1-5
Figure 1-3 Existing Major Institution Overlay 1-6
Figure 2-1 (rev) Alternative 1 – No Build 2-12
Figure 2.2 Alternative 3 – South Campus Expansion 2-14
Figure 2.3 Alternative 6 – Modified North Campus Expansion 2-16
Figure 2.4 (rev) Alternative 7R – Expanded Boundary, Early Laurelon Development 2-18
Figure 2-4a Alternative 8 – Early Laurelon Development Without Hartmann 2-20
Figure 2-5 (rev) Construction Phasing 2-22
Figure 3.5-1 Existing Noise Level – Nighttime Operation 3.5-2
Figure 3.5-2 Modeled Flight Tracks for Existing Helipad 3.5-5
Figure 3.5-3 Measured Demolition and Excavation Noise Levels with Leqs 3.5-8
Figure 3.5-4 (rev) Predicted Noise Levels – Alternative 3 ....3.5-10
Figure 3.5-5 (rev) Predicted Noise Levels – Alternative 6 ....3.5-11
Figure 3.5-6 (rev) Predicted Noise Levels – Alternative 7R 3.5-12
Figure 3.5-6a Predicted Noise Levels – Alternative 8 ....3.5-13
Figure 3.5-7 Range of Construction Noise 3.5-14
Figure 3.5-8 Modeled Flight Tracks for Temporary Helipad Locations – Alternatives 3 and 6 ....3.5-19
Figure 3.5-9 Modeled Flight Tracks for Proposed Helipad Location – Alternative 3 ....3.5-22
Figure 3.5-10 Modeled Flight Tracks for Proposed Helipad Location – Alternative 6 ....3.5-25
Figure 3.5-11 Modeled Flight Tracks for Proposed Helipad Location – Alternative 7R 3.5-28
Figure 3.5-12 Modeled Flight Tracks for Proposed Helipad Location – Alternative 8 ....3.5-32
Figure 3.9-1 (rev) Height Comparison of Alternatives 3.9-8
Figure 3.10-1 Study Area and Key Intersections 3.10-3
Figure 3.10-2 Existing Local Street System and Traffic Control 3.10-4
Figure 3.10-3 Proposed Street System and Traffic Control – Alternatives 3 and 6 ....3.10-8
Figure 3.10-4 (rev) Proposed Street System and Traffic Control – Alternatives 7R and 8 ....3.10-9
Figure 3.10-5 Existing Peak Hour Levels of Service Summary 3.10-16
Figure 3.10-6 (rev) Build Alternatives Peak Hour Levels of Service Summary Without NE 50th Street Access 3.10-26
Figure 3.10-6a Build Alternatives Peak Hour Levels of Service Summary With NE 50th Street Access 3.10-27
Figure 3.10-7 (rev) Existing Parking Facilities 3.10-30
Figure 3.10-8 (rev) Proposed Parking Supply 3.10-35
Figure 3.10-9 Existing Non-Motorized Facilities 3.10-41
Figure 3.10-10 Proposed Non-Motorized Facilities – Alternatives 3 and 6 ....3.10-42
Figure 3.10-11 (rev) Proposed Non-Motorized Facilities – Alternatives 7R and 8 ....3.10-43
Figure 3.10-12 Existing Shuttle and Transit Service 3.10-45

Appendices

Appendix A – Estimated Greenhouse Gas Emissions
Appendix B – Helistop Patient Landings and Relocated Helistop Noise Analysis
Appendix C – Height, Bulk and Scale Figures, Shadow Figures
Appendix D – Transportation
Appendix E – Comments and Responses on the Draft EIS

Section 1 - Summary

1.1 Background and Purpose

Anna Clise, with the help of friends, founded the Children's Hospital ~~and Regional Medical Center (Children's) was founded~~ in 1907. Since that time, the hospital has evolved into a specialized pediatric and adolescent academic medical center serving Washington, Alaska, Montana, and Idaho. The hospital moved to its current 21.7-acre site in northeast Seattle in 1953. In 2008, the hospital organization adopted a new name, Seattle Children's Hospital (Children's).

Children's Major Institution Master Plan (MIMP) was adopted by Ordinance #117319 in September 1994 and remains in effect today. A Draft and Final Environmental Impact Statement (EIS) were prepared for public review and comment in October 1992 and June 1993, respectively. Subsequent EIS addenda were prepared for specific phases of development.

Most of the approved development has been completed, except for approximately 54,000 gross square feet (sf) of unbuilt area. ~~Approximately 20,000 – 25,000 sf of the unbuilt area is currently under design to add approximately 20 to 22[1] inpatient beds on a new floor on the top of the Train building.~~

The master plan proposal and alternatives are meant to 1) reflect the programmatic needs of Children's and 2) begin to address comments provided by the community during community meetings held in May and June 2007 on the master plan, ~~and~~ during EIS scoping (August – October 2007), and during the comment period on the DEIS (June 9 – July 25, 2008); and to respond to comments received from the public during public meetings including those comments made to the Citizens Advisory Committee during their meetings.

1.1.1 Health Care Needs

Health care needs are described by Children's based on national trends, regional population and facility capacity. Nationally, the need for children's health care is growing. A recent study by the Child Health Corporation of America, a national association of free-standing pediatric hospitals, shows that the inpatient demand for pediatric services overall is estimated to grow 3.1 percent annually through 2010 (CHCA 2007). Causes include:

- Increased severity of pediatric illnesses
- Increases in prematurity and low birth weight
- Increased prevalence of chronic conditions, such as diabetes and developmental disorders
- Growing prevalence of obesity, which complicates care
- More patients surviving childhood diseases and utilizing health care services longer

[1] Number of beds will be determined through the State's Certificate of Need process and the City's Master Use Permit approval process.

- Single-bed rooms needed to control the potential spread of infectious diseases

The Puget Sound Regional Council estimates the population of central Puget Sound to have reached 3,524,000 in 2006, an increase of 2 million people since 1960. Natural increase (births minus deaths) accounted for 44 percent of the region's growth at an average of 19,100 persons per year. In addition, there was a 56 percent increase in population due to net migrations (people moving into the region minus people moving out) (Puget Sound Regional Council 2007).

US Census data shows that the average family size has been rising slightly in King County, primarily in 5+ person households. The increase is attributable, in part, to brisk growth in the foreign-born population and subpopulations with larger average family sizes. The region's foreign-born population grew by 89 percent during the 1990s, compared to 19 percent for the general population, with over two-thirds of the growth occurring in King County (Puget Sound Regional Council 2007).

Children's is experiencing the effects of the local and regional population growth. Since Children's last Certificate of Need was issued in 2001 by the Washington State Department of Health (which determines number of inpatient beds), the hospital has been directly affected by increasing patient volumes and intensified levels of care.

The State's Certificate of Need process is intended to: promote, maintain, and assure the health of all citizens in the state; provide access to health services, health manpower and health facilities; and avoid unnecessary duplication and control increases in costs. To gain approval, an applicant must demonstrate that its proposed project is: needed, financially viable, can be operated in conformance with certain quality assurances, and contains costs. In order to obtain a Certificate of Need, an applicant must provide the state with: capital costs refined so as to be within +/-12 percent of actual at completion; project timeline (project must be commenced within two years of approval or the Certificate of Need is forfeited); architectural drawings; demonstration of site control; and documentation that the proposed site may be used for the proposed project and is appropriately zoned. Because of the requirement that the project construction must commence within two years of approval and the site approvals have been obtained, Children's cannot apply for a Certificate of Need until they have obtained approval of their Major Institution Master Plan.[~~2~~]

As a national standard of care, the recommended average inpatient occupancy level is 65 percent, because pediatric illness is unpredictable (patients with chronic, life-long diseases are more likely to have unplanned admissions) and patients must be admitted to units appropriate to their age and acuity level. Children's reports that it currently operates at 75 percent occupancy or above, and at times it is at full capacity.

1.2 Site and Site Vicinity

Children's is located in Northeast Seattle ~~within~~ adjacent to the Laurelhurst and Bryant neighborhoods, and is 0.5 mile from the Ravenna portion of the University Community Urban

[~~2~~] ~~A Certificate of Need will also be required for the additional 20 to 22 beds proposed to be added to the top of the Train building under the existing MIMP. Children's will apply for the Certificate of Need for those beds once the design of the additional floor has been completed.~~

Center. The surrounding neighborhood is primarily single family homes, and includes a mixture of multi-family residences, retail/commercial businesses, institutions, and recreational opportunities, such as the Burke-Gilman Trail, Laurelhurst Playfield and Magnuson Park. The retail/commercial businesses are located primarily west of Children's along Sand Point Way NE, and include University Village, restaurants and shops, an exercise gym, office space, and the Virginia Mason Pediatric Clinic. There are several institutions in the area, including the Children's 70th and Sand Point Way facility, churches, Talaris Research and Conference Center, Laurelhurst Elementary School, and Villa Academy (Figure 1-1). The nearest Major Institution in the area, the University of Washington, is less than a mile to the west.

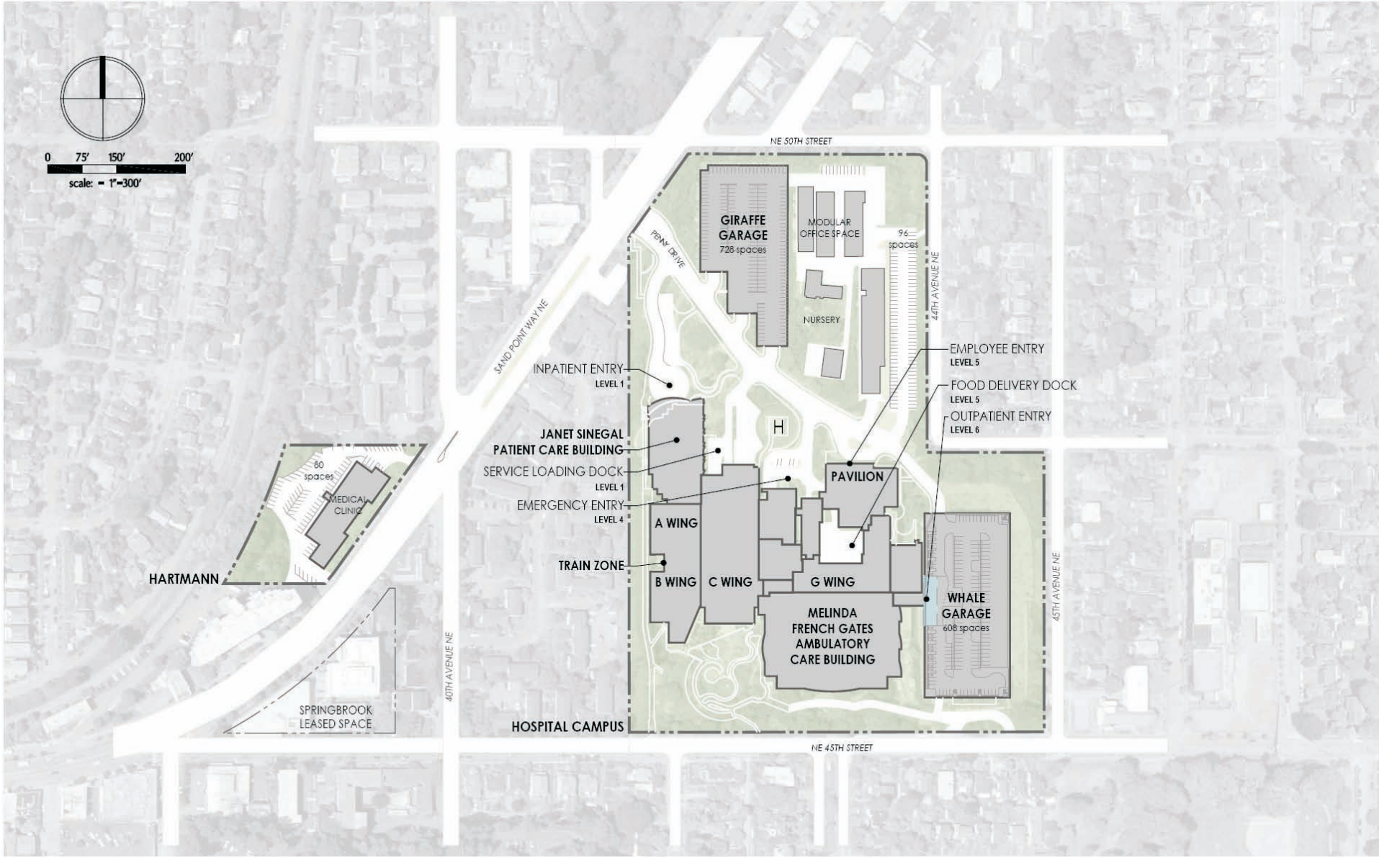
Children's campus contains one primary access, Penny Drive, via Sand Point Way NE. Most of the building area is located south of Penny Drive, with two parking garages: Giraffe Garage north of Penny Drive and Whale Garage on the eastern portion of the site (Figure 1-2). Three public pedestrian entrances to the hospital complex include: Inpatient (Giraffe) Entrance (northwest corner of the building), Emergency Entrance (north-central portion of the building), and Whale Entrance (east side of the building). A fourth entrance for employees is the Airplane Entrance (northeast corner of the building).

The existing Major Institution Overlay (MIO) district boundaries, heights and zoning of adjacent properties are shown in Figure 1-3. The overlay contains four height districts: 37, 50, 70 and 90 feet. The site generally slopes downward from east to west and from north to south. The existing setbacks are approximately 20 feet on the north, 40 feet on the west and a portion of the east, and 75 feet on the south and a portion of the east. Many of the setbacks are heavily landscaped to create a screen between the campus and surrounding neighborhood.

In addition to the MIO height limits, the Seattle City Council set further conditions on the heights of two buildings on the campus ~~after~~ as part of its approval of the master plan in 1993. The Janet Sinegal Patient Care Building is located in the MIO 90 area of the campus, and was limited in height to 74 feet with an additional 15 feet allowed for mechanical equipment (a total of 89 feet with mechanical). The Melinda French Gates Ambulatory Care Building is located in a MIO 70 area of the campus and portions of this building were limited in height to 54.5 feet.

Figure 1-1
Site Vicinity

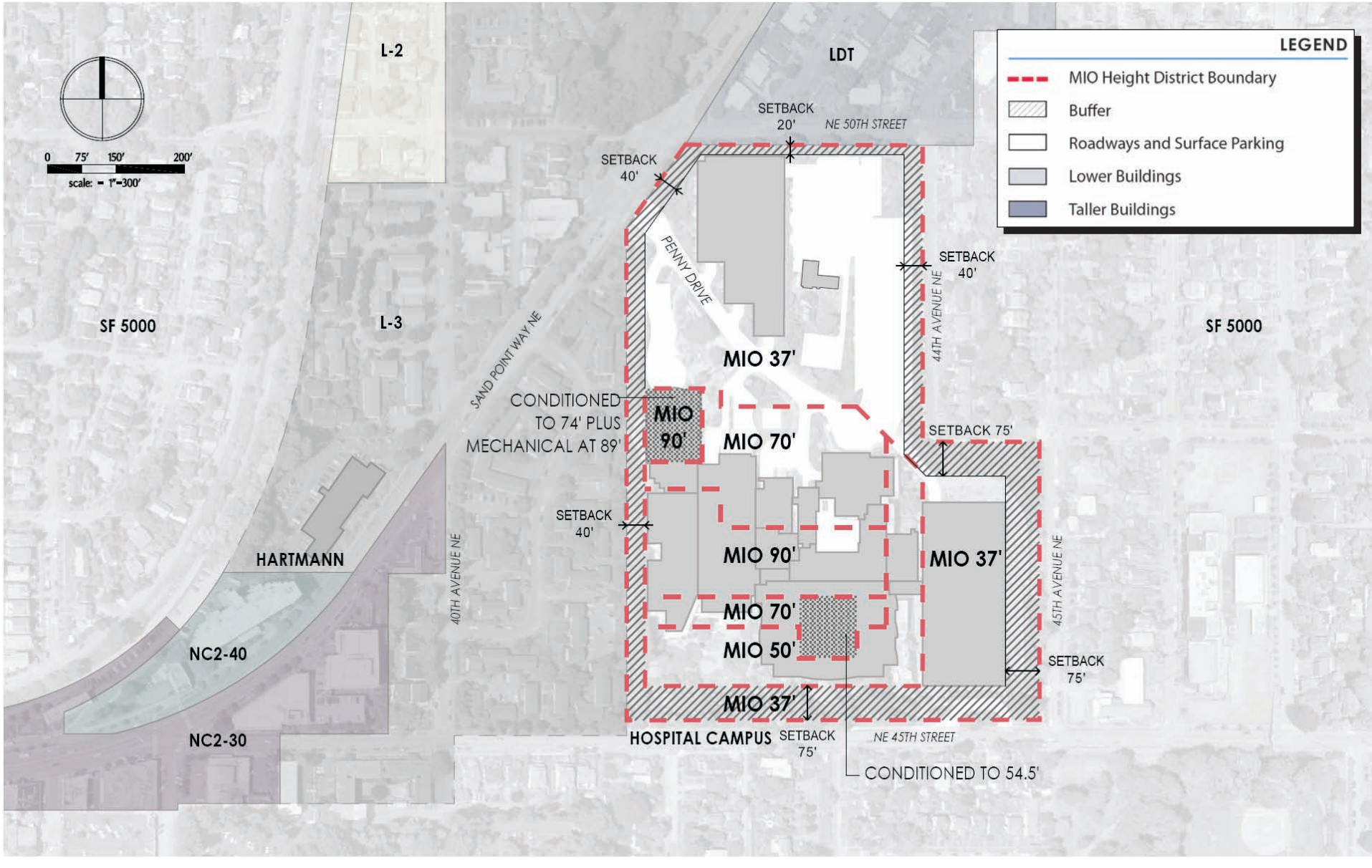
33759484_02.cdr



Source: Zimmer Gunsul Frasca Architects LLP

Figure 1-2
Hospital Campus

33759484_03.cdr



Source: Zimmer Gunsul Frasca Architects LLP

Figure 1-3
Existing Major Institution Overlay

1.3 Description of Alternatives

In its July 2007 Concept Plan, Children's proposed two alternatives for further development of the campus. In response to comments received from the public and the City of Seattle, in its January 2008 Preliminary Draft Master Plan, Children's proposed four build alternatives in addition to the No Build Alternative. A number of comments were received from the City Departments, the Citizens Advisory Committee (CAC) and the public on the alternatives and their design features shown in the January 2008 plan. In response, Children's has considered the following alternatives and has eliminated them from further study for the reasons identified below.

- **Alternative 2 – Initial Concept:** This alternative proposed the total development of 2.23 million square feet on campus at heights up to 240 feet south of Penny Drive and up to 50 feet north of Penny Drive, plus 170,000 square feet of development on Hartmann site at heights up to 105 feet (reduced from original concept of 150 feet). This alternative was eliminated at the request of both the City's Department of Planning and Development and the Citizen's Advisory Committee.
- **Alternative 4 – Expanded Boundary, Late Laurelon Development:** This alternative proposed the development of 2.23 million square feet on campus at heights up to 160 feet south of Penny Drive and up to 90 feet north of Penny Drive, up to 160 feet on Laurelon Terrace site, plus 170,000 square feet of development on the Hartmann site at heights up to 105 feet. This alternative was eliminated by Children's and replaced by new Alternative 7 showing an alternative based on an earlier acquisition of the Laurelon Terrace property. (Alternative 7 has been revised and is now included as Alternative 7R. Both Alternative 7R and new Alternative 8 assume an early acquisition of the Laurelon terrace property.)
- **Alternative 5 – North Campus Expansion:** This alternative proposed the development of 2.23 million square feet on campus at heights up to 160 feet south of Penny Drive and up to 90 feet north of Penny Drive, plus 170,000 square feet of development on Hartmann site at heights up to 105 feet. This alternative was eliminated by Children's as the design features are very similar to new Alternative 6 – Modified CAC Campus Expansion.
- **CAC Campus Expansion Alternative:** In January 2008 the CAC formed a subcommittee to develop design guidelines for a Citizen's Advisory Committee-proposed alternative. The design guidelines would have allowed the development of up to 1.9 million square feet on campus at heights up to 128 feet south of Penny Drive and 90 feet north of Penny Drive. While not included in the MIO, the Hartmann site could be rezoned to a Neighborhood Commercial zone (NC3) at a height of 50 feet, allowing up to 135,000 square feet on the Hartmann site. This alternative was determined not to meet Children's stated project objectives of being able to add up to 350 beds over the next 15 to 20 years. Children's has incorporated design guidelines proposed by the Citizen's Advisory Committee and developed a new Alternative 6 – Modified CAC Campus Expansion.

- **Site Access:** Children's is no longer proposing that general site access be provided on 45th Street NE for any of the Build Alternatives, and is no longer proposing that general site access be provided on 50th Street NE for Alternative 7, nor is general site access from 50th Street NE proposed for Alternatives 7R or 8. Alternatives 3 and 6 include a new shuttle only access point on 45th Street NE to facilitate and improve transit access on the campus and to the neighborhood.

Children's revised ~~The~~ the alternatives described in the April 2008 Draft Master Plan in response to comments received from the Citizens Advisory Committee and the public during the comment period on the Draft EIS. Children's has revised Alternative 7, which would expand the boundary of the campus to include both the Hartmann and Laurelon Terrace condominium sites, has been revised as is now depicted as Alternative 7R. A variation on Alternative 7R which would exclude the use of the Hartmann site has been added and depicted as Alternative 8. The alternatives described in the August 2008 Preliminary Final Master Plan are summarized in Table 1-1 and are described in more detail in Section 2.6.

Children's has proposed to construct the additional square footage in four phases over the next twenty years. (See Section 2.7 for a description of each phase and the estimated timing). Table 1-1a provides a summary comparison of the existing and proposed square footage for the alternatives. Depending on the alternative, the total square footage at the completion of construction is currently estimated to range from 2.36 million to 2.43 million sf. Children's has requested approval for 2.4 million sf.

Children's has considered each of the four Build Alternatives described in the Final EIS and has selected Alternative 7R, Expanded Boundary, Early Laurelon Development as its proposed Final Master Plan.

Table 1-1
Alternatives Proposed in ~~June~~ August 2008 ~~Draft~~ Preliminary Final Master Plan and Analyzed in This ~~DEIS~~ FEIS

	Alternative 1 – No Build	**Alternative 3 – ~~Proposed~~South Campus Expansion**	**Alternative 6 – Modified North Campus Expansion**	**Alternative 7R – Expanded Boundary, Early Laurelon Development**	**Alternative 8 – Early Laurelon Development without Hartmann**
Institution Boundary	Existing 21.7-acre site	Existing 21.7-acre site and 1.78-acre Hartmann site (redeveloped)	Existing 21.7-acre site (1.78-acre Hartmann site outside of MIO boundary)	Existing 21.7-acre site, 1.78-acre Hartmann site (redeveloped) and 6.75-acre Laurelon Terrace site (redeveloped)	Existing 21.7-acre site and 6.75-acre Laurelon Terrace site (redeveloped) (1.78-acre Hartmann site outside of MIO boundary)
Total building area within MIO	~900,000 gsf campus	~2.23 million gsf hospital campus; 170,000 gsf Hartmann	~2.23 million gsf hospital campus;	~~2.23~~2.25 million gsf hospital campus and Laurelon Terrace; ~~170,000~~150,000 gsf Hartmann	~2.4 million gsf hospital campus and Laurelon Terrace
Leased space outside MIO within 2,500 feet	Springbrook ~~4,000~~6,700 gsf	Pursuant to SMC 23.69.022	Pursuant to SMC 23.69.022	Pursuant to SMC 23.69.022	Pursuant to SMC 23.69.022
Owned space outside MIO within 2,500 feet	Hartmann 16,228 gsf	0 gsf (Hartmann incorporated into Institutional Boundary)	Hartmann 170,000 gsf and re-zoned to NC3 with 65' height	0 gsf (Hartmann incorporated into Institutional Boundary)	Hartmann 16,228 gsf (continuation of existing use)
Uses	Approximately 270–272 bed hospital, clinic, clinical research, office, and clinical laboratory; existing clinic and office at Hartmann	500–600 bed hospital, clinic, clinical research, clinical laboratory, office on campus; clinic and office at Hartmann	500–600 bed hospital, clinic, clinical research, clinical laboratory, office on campus; clinic and office at Hartmann	500–600 bed hospital, clinic, clinical research, clinical laboratory, office on campus; clinic and office at Hartmann	500–600 bed hospital, clinic, clinical research, clinical laboratory, office on campus; existing clinic and office at Hartmann

Table 1-1
Alternatives Proposed in ~~April~~ August 2008 ~~Draft~~Preliminary Final Master Plan and Analyzed in This ~~DEIS~~ FEIS (continued)

	Alternative 1 – No Build	Alternative 3 – ~~Proposed~~South Campus Expansion	Alternative 6 – Modified North Campus Expansion	Alternative 7R – Expanded Boundary, Early Laurelon Development	Alternative 8 – Early Laurelon Development without Hartmann
Street vacations	None	None	None	41st Avenue NE and NE 46th Street between Sand Point Way NE and 40th Avenue NE	41st Avenue NE and NE 46th Street between Sand Point Way and 40th Avenue NE
Parking	~2,182 total stalls: 1,462 on hospital campus 80 at Hartmann 640 off-campus	~3,600 total stalls: 2,570 on hospital campus 530 at Hartmann 500 off-campus	~3,600 total: 2,845 on hospital campus 255 at Hartmann 500 off-campus	~3,600 total: ~~2,845~~2,875 on expanded hospital campus ~~255~~ 225 at Hartmann 500 off-campus	~3,600 total: 3,100 on expanded hospital campus 500 off-campus
Parking location (amount)	Whale (608) and Giraffe (728) Garages; surface (97) lots; miscellaneous loading (30); Hartmann (80) surface); off-campus (640) leased parking	Whale Garage (608); new garage on north portion of the campus to replace existing Giraffe Garage (1962); new underground parking at Hartmann (530); off-campus leased parking (500)	Whale Garage (608); new garage on north portion of the campus to replace existing Giraffe Garage (2237); new underground parking at Hartmann (255); off-campus leased parking (500)	Whale Garage (608); new garage on north portion of the campus to replace existing Giraffe Garage (~~1332~~1,167); new above-ground structured parking at Laurelon Terrace (~~905~~1,100), new underground parking at Hartmann (~~255~~225); off-campus leased parking (500)	Whale Garage (608); new garage on north portion of the campus to replace existing Giraffe Garage (1,279); new above-ground structured parking at Laurelon Terrace (1,213), off-campus leased parking (500)

Table 1-1
Alternatives Proposed in ~~April~~ August 2008 ~~Draft~~Preliminary Final Master Plan and Analyzed in This ~~DEIS~~ FEIS (continued)

	Alternative 1 – No Build	**Alternative 3 – ~~Proposed~~South Campus Expansion**	**Alternative 6 – Modified North Campus Expansion**	**Alternative 7R – Expanded Boundary, Early Laurelon Development**	**Alternative 8 – Early Laurelon Development without Hartmann**
Access	1 primary access: Sand Point Way NE (existing): full movements	3 campus access points: Sand Point Way NE (existing), full movements; NE 50th Street, right in, left out; NE 45th Street, shuttle only left in/right out Hartmann (1 access), full movements	3 campus access points: Sand Point Way NE (existing), full movements; NE 50th Street, right in, left out; NE 45th Street: shuttle only left in/right out Hartmann (1 access): full movements	3 campus access points: ~~(2)~~ Sand Point Way NE (existing full movements~~ & new right in/right out): full movements;~~ 2 on 40th Avenue NE, full movements Hartmann (1 access): full movements	3 campus access points: Sand Point Way NE (existing full movements): and 2 on 40th Avenue NE, full movements
Height limit for MIO					
Campus – North of Penny Drive	MIO of 37’	MIO of 50’	MIO of 37’, 50’, 65’ and 90’	MIO of 37’ and ~~50’~~65’	MIO of 37’ and 65’
Campus – South of Penny Drive	MIO of 37', 50', 70', and 90'	MIO of 37', 50', 70', 90' and 105' on the east, MIO of 37', 50', 90', 105' and 160' on the west	MIO of 37’, 50’, 65’, 70’, and 90’ on the east; MIO of 37’, 50’, 70’, 90’, and 160’ on the west	MIO of 37', 50’, 70' and 90' on the east, MIO of 50', 70’, 90' and 160' on the west	MIO of 37', 50’, 70' and 90' on the east, MIO of 50', 70’, 90' and 160' on the west
Laurelon Terrace	L-3 Zoning with 37’ (outside the MIO)			Laurelon Terrace site developed at MIO of 37’, 50' and 160'	Laurelon Terrace site developed at MIO of 37’, 50' and 160’

Table 1-1
Alternatives Proposed in ~~April~~ August 2008 ~~Draft~~Preliminary Final Master Plan and Analyzed in This ~~DEIS~~ FEIS (continued)

	Alternative 1 – No Build	**Alternative 3 – ~~Proposed~~South Campus Expansion**	**Alternative 6 – Modified North Campus Expansion**	**Alternative 7R – Expanded Boundary, Early Laurelon Development**	**Alternative 8 – Early Laurelon Development without Hartmann**
Hartmann Site	L-3 Zoning with 30 to 35' Continuation of existing non-conforming use	Hartmann site developed at MIO 50' to 105'	Hartmann re-zoned to NC3 with 65', outside of MIO	Hartmann site developed at MIO 65'	L-3 Zoning with 30 to 35' Continuation of existing non-conforming use

gsf – gross square feet
SMC – Seattle Municipal Code

Table 1-1a
Summary Comparison of Existing and Proposed Square Footage

	Phase 1	Phase 2	Phase 3A & 3B	Phase 4	Total New	Total Net
Alternative 1 No Build						
Net Square Footage					**0**	**900,000**
Alternative 3						
Existing Sq Ft	900,000	1,458,000	1,838,000	2,046,000		
Proposed Building Sq Ft	623,000	499,000	208,000	347,000		
Existing Campus Demolition Square Footage	65,000	119,000	0	0		
Net New Square Footage	558,000	380,000	208,000	347,000	**1,493,000**	**2,393,000**
Net Total Square Footage	1,458,000	1,838,000	2,046,000	2,393,000		
Alternative 6						
Existing Sq Ft	900,000	1,225,000	1,712,000	1,932,000		
Proposed Building Sq Ft	390,000	606,000	220,000	493,000		
Existing Campus Demolition Square Footage	65,000	119,000	0	0		
Net New Square Footage	325,000	487,000	220,000	493,000	**1,525,000**	**2,425,000**
Net Total Square Footage	1,225,000	1,712,000	1,932,000	2,425,000		
Alternative 7R						
Existing Sq Ft	900,000	1,492,000	1,754,000	2,210,000		
Proposed Building Sq Ft	592,000	327,000	592,000	147,000		
Existing Campus Demolition Square Footage	0	65000	136,000	0		
Net New Square Footage	592,000	262,000	456,000	147,000	**1,457,000**	**2,357,000**
Net Total Square Footage	1,492,000	1,754,000	2,210,000	2,357,000		
Alternative 8						
Existing Sq Ft	900,000	1,492,000	1,604,000	2,210,000		
Proposed Building Sq Ft	592,000	177,000	742,000	147,000		
Existing Campus Demolition Square Footage	0	65000	136,000	0		
Net New Square Footage	592,000	112,000	606,000	147,000	**1,457,000**	**2,357,000**
Net Total Square Footage	1,492,000	1,604,000	2,210,000	2,357,000		

1.4 Summary of Potential Impacts

A summary comparing potential environmental impacts of each alternative discussed in Section 3 is shown in Table 1-2. See Section 3 for more details.

1.5 Summary of Potential Mitigation Measures

A summary of potential mitigation measures discussed in Section 3 are shown in Table 1-3. See the mitigation sections included for each element of the environment in Section 3 for more details.

1.6 Significant Unavoidable Adverse Impacts

Significant unavoidable adverse impacts are those adverse impacts that would remain even after applying mitigation measures, or for which no mitigation measures would be effective.

Table 1-4 summarizes the significant unavoidable adverse impacts anticipated to be caused by each of the alternatives.

1.7 Secondary and Cumulative Impacts

Secondary impacts are caused by the proposed project and are reasonably foreseeable, but are later in time or farther removed in distance than direct impacts. Examples are changes in land use and economic vitality (including induced new development, growth and population), water quality, and natural resources. Cumulative impacts are impacts that result from the incremental consequences of a project when added to other past or reasonable foreseeable future actions. The cumulative effects may be undetectable when viewed individually, but added to other disturbances, eventually lead to a measurable environmental change. Examples are changes to land use, the loss of wetland areas, and the elimination of wildlife habitats caused by a combination of new developments in areas that were formerly open space.

Table 1-5 summarizes the secondary and cumulative impacts anticipated to be caused by each of the alternatives.

Table 1-2 Summary of Potential Impacts

Environmental Element	Construction and Operation Phases	Alternative 1 - No Build	Alternative 3 - ~~Proposed~~South Campus Expansion	Alternative 6 - Modified North Campus Expansion	Alternative 7R - Expanded Boundary, Early Laurelon Development	Alternative 8 - Early Laurelon Development without Hartmann
Geology	Construction	No impacts	No impacts at Children's; shoring of steep slope expected at Hartmann	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3 at Children's; no change at Hartmann
	Operation	No impacts	No impacts	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3
Air Quality	Construction	No impacts	Potential temporary impacts from fugitive dust and emission throughout the construction activities	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3
	Operation	Impacts as typical with an institution	Impacts as typical with an institution	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3
Water	Construction	No impacts	Impacts due to potential for increased subsurface or surface water flows. Impacts due to potential for silt-laden runoff to reach stormwater.	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3
	Operation	No impacts	Improved subsurface water collection. Low impact on groundwater recharge.	Same as Alternative 3	New drainage system would be required for the Laurelon Terrace site.	Same as Alternative 7R

Table 1-2
Summary of Potential Impacts
(continued)

Environmental Element	Construction and Operation Phases	Alternative 1 - No Build	Alternative 3 - ~~Proposed~~South Campus Expansion	Alternative 6 - Modified North Campus Expansion	Alternative 7R - Expanded Boundary, Early Laurelon Development	Alternative 8 - Early Laurelon Development without Hartmann
Energy and Natural Resources	Construction	Energy and natural resources would be used in constructing an additional floor on the Train building.	All alternatives would require the use of fuel (diesel) for construction equipment.	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3
	Operation	There would be some increase in the amount of natural gas and electricity consumed for the additional ~~floor housing approximately 20 - 22 inpatient beds~~54,000 square feet of development.	The amount of natural gas and electricity consumed would increase; no impacts to energy distribution systems or solar heating of the site expected.	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3
Noise	Construction	Short-term temporary noise impact could potentially occur if Children's were to construct the 54,000 square feet remaining for development under the existing MIMP. ~~during the one year construction period for the addition of a new floor on the top of the Train building~~	Intermittent significant unavoidable adverse impacts during period of noisy construction activities (demolition, excavation, and structure erection).	Same as Alternative 3	Same as Alternatives 3 and 6 for residents near Hartmann site. Less impact for residents east of existing campus than Alternatives 3 and 6. More impact for residents nearer the Laurelon Terrace site than Alternatives 3 and 6.	Construction noise levels would be less than Alternatives 3, 6 and 7R for Bryant neighborhood as there would be no development at Hartmann site. Construction noise for residents surrounding the Laurelon Terrace site would be the same as for Alternative 7R.
	Operation	No impacts	Minor impacts as typical with an institution	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3
Hazardous Materials	Construction	No impacts	Impact from potential for fuel spills during refueling of construction equipment	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3

Table 1-2
Summary of Potential Impacts
(continued)

Environmental Element	Construction and Operation Phases	Alternative 1 - No Build	Alternative 3 - ~~Proposed~~South Campus Expansion	Alternative 6 - Modified North Campus Expansion	Alternative 7R - Expanded Boundary, Early Laurelon Development	Alternative 8 - Early Laurelon Development without Hartmann
	Operation	Slight increase in the amount of hazardous materials stored on site.	Slight increased risk of upset due to increased number of emergency diesel generators. Increase in the amount of hazardous materials and radioactive waste.	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3
Land Use	Construction	Impacts from construction activities	Impacts from construction activities	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3
	Operation	No impacts	Impacts would be minor to moderate on surrounding land uses	Same as Alternative 3	Conversion of housing to medical use at Laurelon Terrace property would be an impact. The resultant remaining half block wide multi-family zone between the hospital and NC2-40 zone would be ~~considered an~~ impacted.	Same as Alternative 7R
Housing	Construction	No impacts	No impacts	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3
	Operation	Impacts from minimal increases in staffing and patient levels	Impact due to need for additional staff housing, and need for additional patient family and visitor overnight accommodations	Impact due to need for additional staff housing, and need for additional patient family and visitor overnight accommodations	If not mitigated, a significant Impact on multi-family housing by removing 136 moderately-priced housing units from the neighborhood and northeast Seattle. Children's has proposed a housing replacement package that is under review by the City.	Same as Alternative 7R

Table 1-2
Summary of Potential Impacts
(continued)

Environmental Element	Construction and Operation Phases	Alternative 1 - No Build	Alternative 3 - ~~Proposed~~South Campus Expansion	Alternative 6 - Modified North Campus Expansion	Alternative 7R - Expanded Boundary, Early Laurelon Development	Alternative 8 - Early Laurelon Development without Hartmann
Aesthetics (height, bulk and scale)/Light, Glare and Shadows	Construction	No impacts	Short-term aesthetic impacts	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3
	Operation	No impacts	No mountain or territorial views would be affected from viewpoints ~~2,~~ 3, 5, 6, 7, ~~or~~ 8, 9, 10, 11 and 13. Views to the Olympic Mountains and territorial views would be obstructed or partially obstructed from viewpoint 4. The general character of the Sand Point Way and NE 45th Street retail area would not be impacted. Shadows in the morning would extend northwest over the existing Children's buildings, a portion of Laurelon Terrace, Sand Point Way NE, and NE 50th Street. Shadows in the afternoon would extend northeast over the existing surface parking area and onto residences along 44th Avenue NE north of NE 47th Street.	Effects would be similar to Alternative 3 but less from viewpoints 2, 3, 4, ~~and~~ 6, 9, 10, 11, 12 and 13. Shadows would extend to the north similar to, but less than Alternative 3 ~~for areas south of Penny Drive and would extend farther for areas north of Penny Drive compared to Alternative 3~~.	Effects would be similar to Alternative 3 for viewpoint 1; less for viewpoints 2, 9, 10, 11, and 12, and greater from viewpoints 7, 8 and 13. More building mass would be visible in the middle-ground for viewpoint 13. Shadows in the morning would reach farther south compared to Alternative 3. Off-site shadows in the afternoon would extend onto 44th Avenue NE and residences and from the building at Hartmann, with less shadow than Alternative 3.	Effects would be similar to Alternative 1 for viewpoints 3, 4, 5, 6 and 9 and similar to Alternative 7R for viewpoints 1, 2, 3, 4, 5, 6, 7, 8, 9 and 11. Effects to views would be slightly greater than Alternative 7R for viewpoint 13 and less than Alternative 7R for viewpoints 9, 10, and 13. Shadows in the morning and afternoon would be similar to Alternative 7R except for additional shadows from the southern-most proposed building. No off-site shadows at Hartmann.

Table 1-2
Summary of Potential Impacts
(continued)

Environmental Element	Construction and Operation Phases	Alternative 1 - No Build	Alternative 3 - ~~Proposed~~South Campus Expansion	Alternative 6 - Modified North Campus Expansion	Alternative 7R - Expanded Boundary, Early Laurelon Development	Alternative 8 - Early Laurelon Development without Hartmann
Transportation	Construction	Short term, temporary impacts due to truck and worker vehicle trips	No parking impacts are anticipated. Temporary impacts from trips due to truck and worker vehicle trips during individual phases are anticipated (20 to 80 truck trips per day) Potential phasing impact on transportation system from combined e~~a~~ffects of construction traffic and new hospital traffic from expansion	~~Same as~~Similar to Alternative 3 with more truck trips due to more excavation	Similar to Alternative ~~3~~6	Similar to Alternative 6

Table 1-2
Summary of Potential Impacts
(continued)

Environmental Element	Construction and Operation Phases	Alternative 1 - No Build	Alternative 3 - ~~Proposed~~South Campus Expansion	Alternative 6 - Modified North Campus Expansion	Alternative 7R - Expanded Boundary, Early Laurelon Development	Alternative 8 - Early Laurelon Development without Hartmann
	Operation – Street System	No impacts	Additional signalized intersection at Sand Point Way NE/NE 50th Street would be closely spaced with traffic signal at Penny Drive Potential for neighborhood motorized and non-motorized traffic impacts on NE 50th Street at intersection with proposed new driveway	Same as Alternative 3	Portions of 41st Avenue NE and NE 46th Street would be vacated. These roadways currently only provide internal access to the Laurelon Terrace Condominiums. This internal access would no longer be needed. No impacts. ~~Additional right-in/right-out turning movements at proposed new Sand Point Way NE access would be closely spaced with existing access at Penny Drive and proposed new access at 40th Ave NE Emergency access at Sand Point Way NE would require removal of a portion of the existing median and some street trees; this access may not be required if internal connection to Penny Drive is provided or if emergency access via 40th Ave NE is determined to be viable~~	Same as Alternative 7R.

Table 1-2
Summary of Potential Impacts
(continued)

Environmental Element	Construction and Operation Phases	Alternative 1 - No Build	Alternative 3 - ~~Proposed~~South Campus Expansion	Alternative 6 - Modified North Campus Expansion	Alternative 7R - Expanded Boundary, Early Laurelon Development	Alternative 8 - Early Laurelon Development without Hartmann
	Operation - Traffic Volumes	~~No build~~No Build 2030 conditions result in 10 to 13 percent growth during peak hours at most study intersections	Children's traffic would increase by approximately 8,400 vehicle trips per day; 850 trips during AM peak hour and 690 trips during PM peak hour. New traffic from Children's would account for the following percentages of future (2030) peak hour traffic at these study intersections: • Montlake: ~~0~~1 to ~~10~~12 percent of both AM and PM peak hour traffic • NE 45th Street: ~~6~~3 to ~~15~~14 percent of both AM and ~~0 to 10 percent of~~ PM peak hour traffic • Five Corners: ~~8~~13 percent of AM and ~~13~~ 8 percent of PM peak hour traffic Other off-site intersections: 0 to 30 percent of AM and 0 to 10 percent of PM peak hour traffic with the higher percentages occurring at intersections nearer to Children's	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3

Table 1-2
Summary of Potential Impacts
(continued)

Environmental Element	Construction and Operation Phases	Alternative 1 - No Build	Alternative 3 - ~~Proposed~~South Campus Expansion	Alternative 6 - Modified North Campus Expansion	Alternative 7R - Expanded Boundary, Early Laurelon Development	Alternative 8 - Early Laurelon Development without Hartmann
	Operation - Traffic Operations	~~Six~~ Five intersections would degrade to LOS E or F: • Five Corners ~~•Montlake Blvd NE/NE 45th Street~~ • Montlake Blvd/EB SR 520 Ramps • 25th Avenue NE/University Village • 40th Avenue NE/NE 55th Street • 40th Avenue NE/NE 65th Street Montlake corridor travel time from Roanoke Street to Children's would increase by ~~1~~ 2 minutes in the NB direction and ~~5~~ 1 minute~~s~~ in the SB direction during PM peak hour NE 45th Street corridor travel time from I-5 to Children's would increase by ~~3~~ 1 minute~~s~~ in the WB direction and 2 minutes in the EB direction during PM peak hour	~~Five~~ Four intersections would degrade to LOS E or F: • Five Corners ~~•Montlake Blvd NE/NE 45th Street~~ • Montlake Blvd/EB SR 520 Ramps • 40th Avenue NE/NE 55th Street • 40th Avenue NE/NE 65th Street Montlake corridor travel time from Roanoke Street to Children's would increase by ~~1 minute in the NB direction and 3~~2 minutes in the SB direction during the PM peak hour NE 45th Street corridor travel time from I-5 to Children's would increase by 3 minutes in both the WB and EB directions during the PM peak hour One additional access point at NE 50th Street would be required in addition to retaining existing access at Penny Drive unless proposed parking is reduced	Same as Alternative 3	Same as Alternative 3 with the exception of access points: • Access on NE 50th Street would not be needed due to the proposed location of parking on the Laurelon Terrace site ~~•New right-in/right-out access proposed on Sand Point Way NE in addition to retaining existing access at Penny Drive~~ • Two n~~N~~ew access points proposed on 40th Avenue NE • No shuttle access is proposed on NE 45th Street	Same as Alternative 7R

Table 1-2
Summary of Potential Impacts
(continued)

Environmental Element	Construction and Operation Phases	Alternative 1 - No Build	Alternative 3 - ~~Proposed~~South Campus Expansion	Alternative 6 - Modified North Campus Expansion	Alternative 7R - Expanded Boundary, Early Laurelon Development	Alternative 8 - Early Laurelon Development without Hartmann
			Shuttle-only left-in/right-out access is proposed on NE 45th Street			
	Operation – Traffic Safety	The potential for traffic safety issues increases proportionately with increase in traffic volumes; impacts would be less than significant	Same as Alternative 1; impacts from increased traffic volumes Additional driveway curb cuts at 50th Avenue NE would increase the potential for motorized and non-motorized traffic conflicts and safety issues	Same as Alternative 1; impacts from increased traffic volumes Same as Alternative 3; potential impacts from 50th Avenue NE driveway curb cut	Same as Alternative 1; impacts from increased traffic volumes Additional driveway curb cuts at ~~Sand Point Way NE and at~~ 40th Avenue NE would increase the potential for motorized and non-motorized traffic conflicts and safety issues	Same as Alternative 1; impacts from increased traffic volumes Same as Alternative 7R - Additional driveway curb cuts at 40th Avenue NE would increase the potential for motorized and non-motorized traffic conflicts and safety issues
	Operation - Parking	No impacts	Children's would provide 3,600 parking spaces with 2,570 located at the hospital, 530 at Hartmann and 500 in leased off-site parking areas The proposed parking supply of 3,600 parking spaces is equal to the effective parking demand of 3,600 vehicles (or 3,100 vehicles with enhanced TMP); no impact	Children's would provide 3,600 parking spaces with 2,845 located at the hospital, 255 at Hartmann and 500 in leased off-site parking areas The proposed parking supply of 3,600 parking spaces is equal to the effective parking demand of 3,600 vehicles (or 3,100 vehicles with enhanced TMP); no impact	~~Same as Alternative 6~~Children's would provide 3,600 parking spaces with 2,875 located at the hospital, 225 at Hartmann and 500 in leased off-site parking areas The proposed parking supply of 3,600 parking spaces is equal to the effective parking demand of 3,600 vehicles (or 3,100 vehicles with enhanced TMP); no impact	Children's would provide 3,600 parking spaces with 3,100 located at the expanded hospital campus and 500 in leased off-site parking areas The proposed parking supply of 3,600 parking spaces is equal to the effective parking demand of 3,600 vehicles (or 3,100 vehicles with enhanced TMP); no impact

Table 1-2
Summary of Potential Impacts
(continued)

Environmental Element	Construction and Operation Phases	Alternative 1 - No Build	Alternative 3 - ~~Proposed~~South Campus Expansion	Alternative 6 - Modified North Campus Expansion	Alternative 7R - Expanded Boundary, Early Laurelon Development	Alternative 8 - Early Laurelon Development without Hartmann
	Operation - Non-motorized	Increases in vehicular background traffic would lead to increases in potential vehicular and non-motorized traffic conflicts	Pedestrian and bicycle safety both on and off-site would be improved through the completion of the sidewalk along Sand Point Way NE, additional signalized crossings at Sand Point Way NE/NE 50th Street, and improved pedestrian/bicycle connections to the Burke-Gilman Trail	Same as Alternative 3	~~Same as~~Similar to Alternative 3 with the exception that a signalized crossing at NE 50th Street would not be installed. In addition, King County Metro bus stops along Sand Point Way NE would be relocated closer to pedestrian entrances at Children's	Same as Alternative 7R
	Operation – Shuttle and Transit Service	Children's shuttle system would continue to serve the remote parking lots and connect to other Children's facilities. Over time, service may be increased with additional shuttle demand.	Children's shuttle system would continue to serve the remote parking lots and connect to other Children's facilities. As part of their mitigation strategy, Children's is proposing enhancements to their current shuttle service, such as providing connections to transit hubs. These enhancements would likely reduce Children's future traffic generation to the campus.	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3
	Operation - TMP	Children's currently exceeds the goal at 38 percent SOV	Assume current 38 percent SOV rate or an enhanced 30 to 40 percent reduction in SOV	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3

Table 1-2
Summary of Potential Impacts
(continued)

Environmental Element	Construction and Operation Phases	Alternative 1 - No Build	Alternative 3 - ~~Proposed~~South Campus Expansion	Alternative 6 - Modified North Campus Expansion	Alternative 7R - Expanded Boundary, Early Laurelon Development	Alternative 8 - Early Laurelon Development without Hartmann
	Operation - Site Access	No impacts	In addition to the existing access on Sand Point Way NE, a new access on NE 50th Street would be needed. To facilitate efficient shuttle access to the campus, a new shuttle-only access is proposed on NE 45th Street. The existing two access points to the Hartmann site would be reduced to one access.	Same as Alternative 3	With the expanded campus, there would be three access points: ~~two~~ one on Sand Point Way NE (existing ~~plus new right in/right out~~); and ~~a~~ two new access points on 40th Avenue NE. There would be no shuttle access on NE 45th Street, and no general site access on NE 50th Street. As with Alternatives 3 and 6, the existing two access points to the Hartmann site would be reduced to one access.	Same as Alternative 7R
	Operation - Helipad	Landings are expected to increase from 60 to approximately 77 per year	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1
Public Services and Utilities	Construction	No impacts	No impacts	No impacts	No impacts	No impacts
	Operation	No impacts	Impacts due to potential for increased calls to fire and police. Impacts due to increased water supply and discharge needs, and increased solid waste.	Same as Alternative 3	Similar to Alternative 3. There would be some offset in increased needs for public services and utilities caused by the removal of 136 units of multi-family housing.	Same as Alternative 7R

SOV – single occupancy vehicle
EB = eastbound WB = westbound

Table 1-3 Summary of Potential Mitigation Measures

Environmental Element	Construction and Operation Phases	Mitigation Measures
Geology	Construction	• Prior to any construction activities along the slope on the Hartmann site, a soils report prepared by a qualified geotechnical engineer or geologist licensed by the State of Washington will be prepared and submitted to the City to demonstrate that it is safe to construct in that area without causing land slides . • All construction on the Hartmann site would comply with the requirements of SMC 25.09 Regulations for Environmentally Critical Areas. • All excavation, drilling, shoring, and foundation support would be performed in accordance with recommendations from the geotechnical and structural engineers based on site-specific exploration of subsurface soil and groundwater conditions. • The foundation and building superstructure would be designed in accordance with the Seattle Building Code, incorporating soil parameters that govern ground motion and forces imparted to the structure. Permanent subsurface walls would be designed to accommodate earth pressure resulting from seismic shaking. • Shoring would be designed and installed using standard soldier-pile and tieback methods that are commonly used in Seattle. • A monitoring program would be implemented to measure vertical and lateral displacements and the occurrence and growth of cracks in existing pavements and walls. The amount of soil withdrawn from drilled holes would be estimated to assess the possible occurrence of caving that would induce ground settlements. The use of steel casings or drilling mud would be adopted where necessary to prevent loss of ground around the holes and accompanying settlements and subsidence. • Any subsurface utilities that are at risk of damage due to settlements or lateral displacement would be re-routed or provided with additional support. • Water entering the excavation would be drained by installing drainage composite materials on the shoring walls and drainage trenches and piping at the bottom of the excavation, in addition to pumping from excavated sumps. Drilled wells may be used to control water where required. • Surface water would be prevented from entering the site to the extent possible. • To minimize tracking soil from the site, the wheels and undercarriages of vehicles leaving the site would be washed and the sediment-laden wash water would be controlled using erosion control methods prescribed as City of Seattle and King County best management practices for construction projects. Such practices include the use of sediment traps, check dams, stabilized entrances to the construction site, erosion control fabric fences and barriers, and other strategies to control and contain sediment. • The soils loaded into the trucks would be covered with tarps or other materials to prevent spillage onto the streets and transport by wind. • Tarps would be used to cover temporary on-site storage piles.
	Operation	No mitigation measures are required.

Table 1-3
Summary of Potential Mitigation Measures
(continued)

Environmental Element	Construction and Operation Phases	Mitigation Measures
Air Quality	Construction	• Children's would participate in project review with the PSCAA. • Prior to demolition of the existing housing units at Laurelon Terrace under Alternatives 7R or 8, an ~~lead paint and~~ asbestos survey would be performed and an abatement plan be developed to prevent the releases into the atmosphere and to protect worker safety. • The construction contractor(s) would be required to comply with PSCAA's Regulation I, Section 9.15 for avoiding dust emissions. • Electrical, non-CO-producing equipment would be used whenever possible. • Exposed soils and debris would be sprayed with water or other dust suppressants to reduce dust, truck wheels and undercarriages would be brushed/washed or pressure-sprayed before leaving the site, and truck loads and routes would be monitored to minimize impacts. • To control particulate emissions, on-road trucks would use technology providing 85 percent particulate control. • Both off-road diesel equipment and on-road diesel haul trucks would use cooled exhaust gas recirculation, aqueous diesel fuel, and diesel particulate filter. • Backfill material would be stabilized during handling, when not actively being handled, and at the completion of activity. • Water would be pre-applied to depth of proposed cuts, and re-applied as necessary to maintain soils in a damp condition and to ensure that visible emissions do not extend more than 100 feet in any direction, and soils stabilized once earth-moving activities are complete. • Material would be stabilized while loading to reduce fugitive dust emissions, at least six inches of freeboard would be maintained on haul vehicles, material would be stabilized while transporting to reduce fugitive dust emissions, and would be stabilized while unloading to reduce fugitive dust emissions. • All off-road traffic, parking areas, and haul routes would be stabilized, and construction traffic directed over established haul routes. • During excavation and trenching, surface soils would be stabilized, and soils stabilized at the completion of trenching activities. • Prolonged periods of vehicle idling and engine-powered equipment would be avoided to reduce emissions. • Delivery of materials that are transported by truck to and from the project area would be scheduled to minimize congestion during peak travel times on adjacent City streets. This would minimize secondary air quality impacts that would otherwise be caused by traffic having to travel at reduced speeds. • Any exposed slopes/dirt would be covered with sheets of plastic. • Perimeter railings around the new building would have mesh partitioning to prevent movement of debris during helicopter landings.
	Operation	• Continued implementation of the Children's TMP would reduce air quality impacts related to longer-term vehicle use. • "State-of-the-art" mechanical venting systems from Children's facilities would be used to minimize potential air quality impacts. • Leaves and sticks and natural vegetation on and around the helipad would continue to be picked up on a regular basis.

Table 1-3
Summary of Potential Mitigation Measures
(continued)

		• The City of Seattle is developing its own criteria to measure and mitigate for greenhouse gas emissions. At this time, no mitigation measures are required by the City. The City is currently using the greenhouse gas emission worksheet developed by King County. A greenhouse gas emission worksheet has been prepared for the full build-out of the project and is included in Appendix A along with the worksheet for the existing hospital emissions.
Water	Construction	• Children's would comply with all applicable requirements related to surface water runoff control and water quality. • A drainage control plan would be prepared to City requirements.
	Operation	• Children's would comply with all applicable requirements related to surface water runoff control and water quality. • A drainage control plan would be prepared to City requirements.
Energy and Natural Resources	Construction	• Construction materials would be reused and recycled to the extent feasible.
	Operation	• Children's would implement energy-saving measures using standards by the Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ or measures of other appropriate organizations. • Children's would meet the requirements of the 2004 Seattle Energy Code, Chapters 11 through 15.
Noise	Construction	• Construction would occur primarily during non-holiday weekdays between 7:00 am and 6:00 pm. • Contractors would be required to minimize construction noise and vibration impacts by shielding of noisy equipment, limiting equipment idling, locating noisy equipment away from property boundaries, and providing adequate mufflers. • Nearby residents would be kept informed of upcoming construction activities that could be potentially loud. Particularly noisy construction activities would be scheduled to avoid neighborhood conflicts whenever possible. • Where feasible, temporary walls, acoustical screens or enclosures would be used around equipment. • To the extent possible, construction truck traffic would be rerouted away from residential areas. • Noisy equipment would be located on site as far away from noise sensitive receivers as possible. • Noisy operations would be combined in the same time period. The overall noise produced would not be significantly higher than the levels produced by the individual operations, however the duration could be reduced. • Where feasible, concrete would be mixed off site and prefabricated building components used. • Unnecessary idling equipment would be turned off. • Electric power would be used rather than diesel equipment where possible. • Impact pile driving would be avoided. Drilled piles or the use of a sonic vibratory pile driver are quieter alternatives. • Specially quieted equipment would be used, such as quieted and enclosed air compressors and power generators. • Efficient mufflers would be used on all engines. • Quieter demolition methods would be selected where possible. For example, sawing slabs into sections that can be loaded onto trucks is a quieter process than demolition by pavement breakers. • Portable pneumatic drills and pavement breakers would be equipped with exhaust mufflers when possible.

Table 1-3
Summary of Potential Mitigation Measures
(continued)

	Operation	• Operation noise would comply with the requirements of the Seattle Municipal Code (SMC) Chapter 25.08 Noise Control. • Designs for all noise generating equipment for all buildings, including the central plant, would be prepared to ensure compliance with SMC Chapter 25.08. • Acoustic barriers and other noise control measures would be used to control rooftop equipment noise. • New state-of-the art ventilation equipment oriented to the interior of the campus would be used to reduce noise levels. • New ventilation equipment would be dispersed throughout the site and incorporated into the new building designs. • Children's will perform on-going noise monitoring to identify and remediate noise issues before the noise levels become problematic for neighboring residents. • Children's will establish and publicize a "noise hot line" for neighbors to report noise complaints with contact information for both non-emergency noise complaints, and after-hour emergency noise violations such as car alarms. Emergency complaints should be called into the hospital security staff. • Helicopter flights are only used when the time saved in transporting an ill child would make a critical difference in the child's care and recovery. Mitigation measures were established in Seattle City Council's conditional use permit for the existing helipad.
Hazardous Materials	Construction	• Children's would follow all applicable safety measures to minimize potential upset. • Children's would continue to update and follow their Chemical Hazard Communication Program and Radiation Safety Procedure Manual according to state and federal standards. • Safeguards consistent with all applicable requirements would be taken to avoid hazards related to the handling, disposal, and transport of hazardous or radioactive materials.
	Operation	• Children's would follow all applicable safety measures to minimize potential upset. • Children's would continue to update and follow their Chemical Hazard Communication Program and Radiation Safety Procedure Manual according to state and federal standards. • Safeguards consistent with all applicable requirements would be taken to avoid hazards related to the handling, disposal, and transport of hazardous or radioactive materials.
Land Use	Construction	No mitigation measures are required. See Air Quality, Noise and Transportation for mitigation measures on air emissions, noise and traffic during construction.
	Operation	See Aesthetics/Light, Glare and Shadow for mitigation measures for height, bulk and scale.

Table 1-3
Summary of Potential Mitigation Measures
(continued)

Housing	Construction	No mitigation measures are proposed.
	Operation	If Alternative 7R or 8 is selected and the housing units in Laurelon Terrace demolished, Children's would be required to propose comparable replacement to maintain the housing stock of the city. ~~Children's has proposed to contribute to the development of 136 new units of housing in northeast Seattle beginning with a contribution to the development of 52 units of housing at Sand Point Magnuson scheduled for groundbreaking in fall of 2009. The approval on the proposed replacement housing would be made by the Seattle City Council.~~ Children's has informed the City's Office of Housing that it will meet, and to the extent feasible and cost-effective, exceed housing replacement responsibilities for the demolition of Laurelon Terrace. Children's says it will work with non-profit housing organizations and the City's Office of Housing and DPD to establish a binding agreement for a specific package of replacement housing. The housing replacement package is intended to address the City's policy and program goals for comparable affordable housing and contribute to the replacement of at least 136 housing units in northeast Seattle. They have also said that participation in the development of affordable housing at Sand Point Magnuson will be a component of the agreement. Per the SEPA housing policy codifed in SMC 25.05.675 I. Housing, c. "*Compliance with legally valid City ordinance provisions relating to housing relocation, demolition and conversion shall constitute compliance with this housing policy.*" The approval on the proposed replacement housing would be made by the City as part of the Major Institution Master Plan review and approval process. If approved, Children's housing replacement package would constitute mitigation for the loss of the Laurelon Terrace housing.
Aesthetics/Light, Glare and Shadows	Construction	No mitigation measures are proposed.
	Operation	To reduce or eliminate aesthetic impacts: • Building facades would be modulated. • Scale-reducing elements, particularly at areas exposed to people activity (e.g., building entrances, adjacent to walkways, places of high visibility) would be identified and encouraged during project design. • Pedestrian amenities would be provided as site improvements. • Landscaping would be provided for pedestrian interest, scale, partial building screening and building contrast. • Children's would work closely with neighbors to strategically place new trees to fill in gaps and improve views where possible to address specific neighbor concerns. • Maintenance of the landscaped buffer would continue throughout the life of the project. To reduce or eliminate light and glare impacts: • Building design would use low-reflective glass and other materials, window recesses and overhangs, and façade modulation. • The amount of reflective surfaces may be limited. • Landscaping, screens, and "green walls" may obstruct light from shining to off site locations. • Nighttime illumination of the site and selected buildings may be restricted and provided only when function or safety requires it. • Interior lighting would be equipped with automatic shut-off times. Automatic shades may be installed where lighting is required for emergency egress. • Parking lots and structures may include screens or landscaping to obstruct glare caused by vehicle

Table 1-3
Summary of Potential Mitigation Measures
(continued)

		headlights. • Lighting fixtures would provide down-lighting or be oriented away from nearby residences.
Transportation	Construction	To prevent damage to area public roadways: • Conduct a pre-construction inventory of the local street system. During construction Children's will work with the City to address any traffic impacts that may be caused by construction activities. After completion of construction, assess the street network to determine potential roadway damage caused by Children's construction and work with the City to make any needed repairs or provide additional mitigation. Children's would develop a construction management plan describing procedures for construction activity including such items as truck routes, hours of operation, and construction parking for approval by the City. The following measures would be included in the construction management plan to mitigate potential traffic and parking impacts of construction activity during each phase of the master plan: • Contractors would be required to direct that all construction worker vehicles be parked in a remote off-site parking lot ~~or in a temporary on-site parking area~~and served by Children's shuttles • Construction activities would be scheduled so that the most intensive activities in terms of construction traffic are spread out over time and avoid period of peak traffic congestion • Safe pedestrian and vehicular circulation would be provided adjacent to the construction site through the use of temporary walkways, signs, and manual traffic control (flaggers) • Construction material delivery vehicles would be prohibited from leaving or entering the area during PM peak hours • The potential parking impact of construction workers could be mitigated by securing additional off-site parking for construction workers and shuttling them to and from the site • Truck routes would be identified
	Operation ~~Proposed Comprehensive and Safety Mobility Plan~~	• Implementation of a TMP to result in approximately 30 percent or lower SOV use by daytime employees and approximately 30 to 40 percent reduction in new PM peak hour traffic generated by the expansion • Contribution of ~~up to~~ $500,000 Intelligent Transportation System (ITS) projects ~~for Sub-area Safety and Mobility Study~~ for two corridors: between Children's campus and I-5 via NE 45th Street; and between Children's and SR 520 via Montlake Boulevard • ~~Funding a share of selected corridor and intersection projects to be determined based on the outcome of the Sub-area Safety and Mobility Study~~ • Contribution of $1.4 million in pro rata share of City-identified Northeast Seattle transportation improvements • Funding of $2 million for City-identified and selected bicycle and pedestrian projects ~~up to $2 million~~ • Commitment to identifying long-term off-site parking facilities
	Intersection Improvements	Contribution of Children's fair share to future installation of traffic signals at 40th Avenue NE and NE 55th Street Contribution of Children's fair share to future installation of traffic signals at 40th Avenue NE and NE 65th Street ~~ontribution of Children's fair share to future enhancement of traffic signal systems at Montlake Boulevard NE and NE 45th Street~~ ~~Sand Point Way NE Right-in/Right-out Driveway Emergency Access – For Alternative 7, Children's is proposing a median break with an actuated emergency vehicle-only traffic signal to accommodate~~

Table 1-3
Summary of Potential Mitigation Measures
(continued)

		~~southbound emergency vehicle traffic~~
	Regional Transportation Partnership Opportunities	Sound Transit University of Washington Station – expansion of shuttle service to connect to station • Sound Transit Brooklyn Station – expansion of shuttle service to connect to station • Regional Park-and-Ride Co-Development – provision of additional parking and expansion of shuttle service to connect to park-and-ride • Partnering with King County Metro – payment to King County for additional service to hospital
	Operation – Helipad	Mitigation measures were established in Seattle City Council's conditional use permit for the existing helipad.
Public Services and Utilities	Construction	• Children's would consult the Fire Department to plan fire access routes to and on site, particularly during construction phases. • Fire flow requirements and hydrant location/capacities would be reviewed with the Fire Department to ensure adequate capacity. • The construction plan and haul routes to be used by trucks would be submitted to the City of Seattle prior to approval of each phase of construction. • All applicable City requirements regarding construction and operational truck routes would be followed. • Contractors would be required to document street pavement conditions prior to, during, and after construction of each phase to ensure no significant street degradation.
	Operation	• Children's would continue to follow Police Department recommended guidelines, which include: provide adequate lighting and clear lines of sight; use of transparent security screening rather than opaque walls; and design to avoid creating hiding places for criminal activity or increased crime risk. • Children's projects would comply with all applicable fire prevention guidelines and life safety codes and requirements. • Children's would continue its water conservation programs, both in grounds maintenance and facility operations. Specific landscape measures include: drought tolerant plantings; computerized controller units for irrigation; zone control watering; and efficient spray nozzles with more uniform water distribution. Facility operational measures to conserve water include: efficient flush valve fixtures; water restrictors; conservation education; and water recycling.

CO – carbon monoxide
HOV – high occupancy vehicle
PSCAA – Puget Sound Clean Air Agency
SOV – single occupancy vehicle
TMP – Transportation Management Program
WSDOT – Washington State Department of Transportation

Table 1-4 Summary of Significant Unavoidable Adverse Impacts

Element of the Environment	Significant Unavoidable Adverse Impact
Geology	No significant unavoidable adverse impacts would be expected.
Air	No significant unavoidable adverse impacts would be expected.
Water	No significant unavoidable adverse impacts would be expected
Energy and Natural Resources	No significant unavoidable adverse impacts would be expected.
Noise	Even with the identified mitigation measures, construction noise would result in intermittent significant unavoidable adverse impacts during period of noisy construction activities (demolition, excavation, and structure erection)
Hazardous Materials	No significant unavoidable adverse impacts would be expected.
Land Use	No significant unavoidable adverse impacts to land use have been identified. The potential for significant adverse impacts for density-related impacts such as loss of housing or increased height, bulk and scale, are addressed in other subsections within Section 3 of this ~~Draft~~ Final EIS.
Housing	At the time of the 2000 census, there were 649 multi-family units in the Laurelhurst/Sand Point Way CRA and 3,013 multi-family units in northeast Seattle. Multi-family or attached housing provides a more affordable housing option for many of Seattle's residents. Through the loss of 136 units at Laurelon Terrace, Alternative 7R or 8 would reduce the available amount of multi-family housing in the Laurelhurst/Sand Point CRA by approximately 21 percent unless the required comparable housing were proposed to be located within the same CRA. This would be a significant loss of moderately priced housing available in the area that would be difficult to replace. Children's has proposed to contribute to the development of 136 new housing units in northeast Seattle, with a contribution to 52 units at Sand Point Magnuson, located at 7400 Sand Point Way NE in Census Tract 41 which is immediately north of the Laurelhurst/Sand Point CRA. At this time, the proposal has been presented by Children's and is under review~~but has yet to be reviewed~~ by the Office of Housing and the Department of Planning and Development~~or accepted by the City Council~~. If the proposal is found to be acceptable as a means of maintaining the housing stock of the city, ~~and if the housing is located in northeast Seattle,~~ the impact of the loss of the 136 units at Laurelon Terrace would ~~remain but could be~~be mitigated and reduced to less than significant.
Aesthetics/Light, Glare and Shadows	The height, bulk and scale of all Build Alternatives when viewed from Sand Point Way NE (viewpoints 2, 7 and 8), would create significant adverse impacts in comparison to surrounding development. Alternatives 7R and 8, due to their proximity to Sand Point Way NE, would have greater adverse impacts in the immediate vicinity of the Laurelon Terrace site (viewpoints 8 and 13) but would be less or not visible from locations east of the existing hospital campus. Alternatives 3 and 6 would affect territorial views from the east and would appear larger when viewed from higher elevations to the west. ~~from Sand Point Way NE (viewpoints 2, 7 and 8) and of Alternatives 7R and 8 when viewed from the street level at Children's would be a significant unavoidable adverse impact.~~ The anticipated light and glare impacts are not expected to be significant. Buildings proposed for all ~~Alternatives~~ alternatives~~3 and 6~~ would cast afternoon shadows to the northeast of Children's and Hartmann during the winter months that would impact private residences. Development alternatives for the Hartmann site include Alternatives 3, 6 and 7R. Building heights would range from 65 feet for Alternatives 6 and 7R to 105 feet for Alternative 3. Foreground or near views from the Burke-Gilman Trail would be blocked by a new building visible behind trees (viewpoint 12); however the building height, bulk and scale would be similar to or less than the existing condominium building to the south, and would not be considered a significant unavoidable adverse impact. The redevelopment of Hartmann proposed under Alternative 3 would cause morning shadows on the Burke-Gilman Trail to the west of Hartmann during the winter months.
Transportation	The build alternatives would accommodate additional amounts of future development at Children's and the Hartmann site, which would contribute to additional travel demand and congestion along arterial corridors including Sand Point Way NE, NE 45th Street, and Montlake Boulevard. The additional development also would increase traffic accessing and

Table 1-4
Summary of Significant Unavoidable Adverse Impacts
(continued)

Element of the Environment	Significant Unavoidable Adverse Impact
	circulating in the area. This added congestion could contribute to poorer performance of the transportation network, in terms of increased delays along several of the corridors and at some specific intersections. **Street System** No significant unavoidable impacts to the street system were identified. **Traffic Volumes** Future (2030) growth in the area would result in increases in regional and local traffic within the study area both without and with the project. In addition, the build alternatives would increase area-wide and local traffic on routes serving the site. The determination of whether the increase in traffic volume is significant is analyzed as part of its ~~affect~~ effect on traffic operations (the impact of added volumes on overall delay, travel times, capacity of corridors, or other factors deemed relevant by decision makers). See "Traffic Operations" below. **Traffic Operations** Implementing the proposed mitigation could reduce the increased travel times for PM peak hour traffic across the Montlake Boulevard and NE 45th Street corridors that would results from the Build Alternatives. It is anticipated that a 40 to 60 percent improvement in travel time could be achieved as a result of this mitigation. ~~There are a number of factors that may contribute to improvement of future traffic operations in the study area, however the results are unknown at this time. These include the implementation of Children's proposed Safety and Mobility Plan, Children's commitment to funding their share of the recommendations that come forth from that plan, and the final configuration of SR 520 and its interface with Montlake Boulevard. In consideration of all of these factors, the addition of Children's traffic to the street system, even with a successful TMP that results in reduced traffic demand, could result in changes to traffic operating conditions that would be considered significant.~~ **Traffic Safety** No significant adverse impacts to safety would occur. With the proposed mitigation, it is probable that overall safety would be enhanced. **Parking** No significant unavoidable adverse impacts to parking would occur. **Non-Motorized Facilities** Children's would provide pedestrian and bicycle enhancements at the hospital and Hartmann site, as well as at near-site intersections and along Sand Point Way NE. In addition, improved connections to the Burke-Gilman Trail have been identified. No significant unavoidable adverse non-motorized impacts are expected. **Shuttle and Transit Services** Children's is in the process of enhancing its existing shuttle services and is exploring expanded shuttle service to accommodate future needs. In addition, Children's has partnered with King County Metro to ensure adequate transit service to the hospital and would continue to form these partnerships in the future. No significant unavoidable adverse shuttle and transit service impacts are expected.
Public Services and Utilities	No significant unavoidable adverse impacts are expected after mitigation.

CRA – Community Reporting Area
SOV – single occupancy vehicle

Table 1-5 Summary of Secondary and Cumulative Impacts

Element of the Environment	Secondary or Cumulative Impact
Geology	No secondary or cumulative impacts would be expected.
Air	Children's, in combination with other projects or general population growth and development in the area, would contribute to increased emissions temporarily during construction.
Water	The increase in impervious surface would be a minor contributor to secondary and cumulative increased flows in surface water runoff.
Energy and Natural Resources	No secondary or cumulative impacts would be expected.
Noise	Secondary and cumulative noise impacts would occur during construction from the addition of construction traffic to area roadways. The percentage of new trips would likely be small relative to overall traffic levels on area roadways.
Hazardous Materials	No secondary or cumulative impacts would be expected.
Land Use	The increase in staffing and patient levels at the hospital would contribute to secondary and cumulative land use changes, both directly and indirectly. There would be increased demands for customer service-type businesses in the nearby retail/commercial area to serve hospital staff, patients and visitors. There may be increased future demand for more intensive zoning along Sand Point Way NE to accommodate additional retail and commercial space. The overall impact is not expected to be significant when viewed in the context of existing and proposed future land uses. For Alternatives 7R or 8, the conversion of the Laurelon Terrace property from multi-family to Medical Major Institution would cause the remaining multi-family zoned land across 40th Avenue NE to become a half block wide zone of multi-family, between commercial property on the west and Medical Major Institution on the west. This land may be subject to future rezone.
Housing	~~By tentatively agreeing to purchase all of the 136 units in Laurelon Terrace, Children's has already increased the value of the individual units to beyond the point of where the selling point would be considered "moderately priced".~~ With Alternatives 3 or 6, the use of the Laurelon Terrace property would be required to conform to the uses permitted within a multi-family zone. This could include maintaining the existing units, perhaps making the units available as rental units, or redeveloping the property into another use that is permitted within the L-3 zoning. If Alternative 7R or 8 is chosen, the Laurelon Terrace units would be demolished and the land redeveloped for hospital use. This would result in less available housing in the area near Children's unless the required comparable housing were proposed to be located within the same CRA. This could cause prospective buyers and renters to move to other areas in greater Seattle. The conversion of the Laurelon Terrace property from multi-family to Medical Major Institution would cause the remaining multi-family zoned land across 40th Avenue NE to become a half block wide zone of multi-family, between commercial property on the west and Medical Major Institution on the west. The effect on the continued availability of these multi-family units is unclear. While there are no known plans to redevelop this property for anything other than the existing multi-family use, the removal of the Laurelon Terrace condominiums could create potential secondary and cumulative impacts by increasing the demand to convert this remaining area of multi-family property to medical or commercial use. If the land were to be rezoned, this could result in the further loss of affordable multi-family housing in this part of Seattle unless ~~new commercial development includes housing~~future development were to include apartment units.
Aesthetics/Light, Glare and Shadows	Additional shadowing, while a direct impact, also contributes to cumulative loss of perceived open area. There is a potential for an overall increase of lighting and glare in the area. Commercial and residential property owners in the area surrounding Children's are replacing existing small-scale buildings and single family homes. The new buildings and homes tend to have larger footprints and more stories. Cumulative height, bulk and scale effects would be anticipated from the proposed project in conjunction with the redevelopment of the nearby commercial, single family and multi-family lots. ~~No aesthetic, light, or glare secondary or cumulative impacts are expected.~~
Transportation	Secondary and cumulative impacts on area roadways are included within the analysis of

	direct impacts.
Public Services and Utilities	The build alternatives in combination with population growth in the City of Seattle would increase the demand on public services and utilities; however each of the identified public services and utilities has the capacity to accept an increase without adverse affects.

Section 2 - Description of Alternatives

2.1 Background and Purpose

Children's was founded in 1907. Since that time, the hospital has evolved into a specialized pediatric and adolescent academic medical center serving Washington, Alaska, Montana, and Idaho. The hospital moved to its current 21.7-acre site in northeast Seattle in 1953.

Children's Major Institution Master Plan was adopted by Ordinance #117319 in September 1994 and remains in effect today. A Draft and Final EIS were prepared for public review and comment in October 1992 and June 1993, respectively. Subsequent EIS addenda were prepared for specific phases of development. Those addenda included:

- EIS Addendum – *A and B-Wing Bed Renovations* (Seattle DCLU 1996)
- EIS Addendum – *Proposed Parking Garage* (Seattle DCLU 2001)
- EIS Addendum – *Proposed Inpatient Wing* (Seattle DCLU 2002)
- EIS Addendum – *Ambulatory Care Building* (Seattle DCLU 2003a)
- EIS Addendum – *Emergency Department/Operating Room* (Seattle DCLU 2003b) – cancelled

Most of the ~~existing~~ approved development has been completed, except for approximately 54,000 gross square feet (sf) of unbuilt area. ~~Approximately 20,000 – 25,000 sf of the unbuilt area is currently under design to add approximately 20 to 22[1] inpatient beds on a new floor on the top of the Train building.~~

Children's submitted ~~A~~ a Notice of Intent to prepare a new Master Plan ~~was submitted by Children's~~ to the City of Seattle Department of Planning and Development on April 18, 2007. Children's began to work with the Department of Neighborhoods in March 2007 to assist with the formation of a Citizen's Advisory Committee. The formation and first meeting of the committee occurred July 18, 2007. Children's has submitted the following documents to the Department of Planning and Development for review:

- A Ceoncept Pplan was submitted ~~by Children's to the Department of Planning and Development~~ July 16, 2007
- ~~and a~~ A Preliminary Master Plan was submitted January 7, 2008
- A Draft Master Plan was submitted June 9, 2008
- A Preliminary Final Master Plan was submitted in August 2008
- A Final Master Plan was submitted on October 28, 2008 for publication on November 10, 2008

[1] Number of beds will be determined through the State's Certificate of Need process and the City's Master Use Permit approval process.

The master plan proposal and alternatives are meant to 1) reflect the programmatic needs of Children's and 2) begin to address comments provided by the community during community meetings held in May and June 2007 on the master plan, ~~and~~ during EIS scoping (August – October 2007), and during the comment period on the Draft EIS (June 9 – July 25, 2008). Those programmatic needs are described below.

2.2 Children's Mission

As provided by Children's, the hospital's stated mission and recent commitments are:

"We believe all children have unique needs and should grow up without illness or injury. With the support of the community and through out spirit of inquiry, we will prevent, treat, and eliminate pediatric disease."

"Children's is committed to improving access to quality pediatric health care".

On the hospital campus in northeast Seattle, inpatient and clinical facilities are consolidated to allow complex pediatric procedures to be performed in centralized diagnostic and ~~treatment~~ therapeutic facilities 24 hours a day. From October 2005 through September 2006, Children's provided for 222,787 patient visits, including 169,968 outpatient visits, 31,852 Emergency Room visits, 12,325 inpatient admissions, and 10,493 surgeries.

Another way to improve access is by bringing Children's services closer to patients. Children's is planning three new ambulatory centers (outpatient facilities) on the Eastside and in Snohomish and South King counties.

In order to make best use of their existing facility, Children's has relocated its research programs to South Lake Union, nearer to the Fred Hutchinson Cancer Research Institute, the Seattle Cancer Care Alliance and the University of Washington. Recently-purchased facilities in downtown Seattle will allow for 1.5 million sf of development to support research.

2.2.1 Children's Strategic Plan

Children's Strategic Plan, developed in 2006, is intended to provide Children's with a foundation for the next 100 years and a plan for integrating the growth of clinical, research and educational programs over the next five years. Through a strategic planning process, Children's defined six key components:

- Build programs that set national standards for quality care
- Improve clinical access and service to families and physicians
- Prevent, treat, and eliminate pediatric disease
- Recruit and retain the best staff at all levels
- Develop the next generation of health-care leaders
- Secure Children's financial future, while keeping its promise to provide high quality care regardless of a family's ability to pay

Both the historical patient care volumes and these strategic development areas provide the basis for future space needs at Children's. Currently Children's has 250 beds within 200 rooms (50 double-occupancy rooms). To meet the projected need, Children's plans to add approximately ~~20 to 22 beds within the next year by adding another floor to the Train building, and 228~~ 250 to ~~328~~ 350 beds over the next ~~15 to~~ 20 years, bringing the total bed count up to 500 – 600. These additional beds would be phased in over time.

2.3 Health Care Needs

2.3.1 National and Regional Context

Nationally, the need for children's health care is growing. A recent study by the Child Health Corporation of America, a national association of free-standing pediatric hospitals, estimates that the inpatient demand for pediatric services overall is estimated to grow 3.1 percent annually through 2010 (CHCA 2007). Causes include:

- Increased severity of pediatric illnesses
- Increases in prematurity and low birth weight
- Increased prevalence of chronic conditions, such as diabetes and developmental disorders
- Growing prevalence of obesity, which complicates care
- More patients surviving childhood diseases and using health care services longer
- Single-bed rooms needed to control the potential spread of infectious diseases

According to Children's and the CHCA studies, areas of pediatric care such as infectious diseases, premature birth-related care and endocrinology are growing at faster rates. Diabetes admissions increased nearly 17 percent between 2000 and 2003. Illnesses treated at academic pediatric medical centers such as Children's tend to be more critical and complex, so they often involve longer hospital stays and the collaboration of many sub-specialists.

Children's reported experience reflects these national trends. In the past five years, Children's patient population has become more chronic and complex, older, more expensive to care for and requiring more frequent hospital and Emergency Department admissions (Neff 2007). More than half of the inpatients at Children's on any given day have life-long, chronic illnesses that they deal with on a daily basis.

Caring for these complex patients requires more staff, more types of specialists, more technology, more equipment, and space to store multiple pieces of equipment that often varies with patient sizes. The specialists will be found in patient rooms, in clinic exam rooms, in offices and other settings on campus so that they can respond to the quick changing conditions of young patients. When a child is more seriously ill, there also will be more visitors who need to be housed close to the child—often in the patient's room or in lobbies. Teaching functions also bring more students and residents to the patient care area. All of these factors lead to more people and more equipment, which require more space in every room compared to hospitals of the past.

In addition, the scope of conditions Children's treats, and the wide range in ages of the patients (premature through 21 years), requires a variety of types of beds. For example, a critically ill premature newborn and a teenager undergoing psychiatric evaluation cannot be housed in the same unit. Children's bed mix includes:

- Neonatal Intensive Care Unit
- Pediatric Intensive Care Unit
- Cardiac Intensive Care Unit
- Inpatient Psychiatric Unit (the only pediatric Inpatient Psychiatric Unit in the Washington, Alaska, Montana, and Idaho region)
- Rehabilitation and Complex Care Unit
- Seattle Cancer Care Alliance Unit (for patients undergoing stem cell transplant and other cancer treatment)
- Surgical Unit
- Medical Unit

2.3.2 Regional Population Growth

The Puget Sound Regional Council estimates the population of central Puget Sound to have reached approximately 3,524,000 in 2006, an increase of 2 million people since 1960. Natural increase (births minus deaths) accounted for 44 percent of the region's growth at an average of 19,100 persons per year. In addition, there was a 56 percent increase in population due to net migrations (people moving into the region minus people moving out) (Puget Sound Regional Council 2007).

US Census data shows that the average family size has been rising slightly in King County, primarily in 5+ person households. The increase is attributable, in part, to growth in the foreign-born population and subpopulations with larger average family sizes. The region's foreign-born population grew by 89 percent during the 1990s, compared to 19 percent for the general population, with over two-thirds of the growth occurring in King County (Puget Sound Regional Council 2006).

2.3.3 Facilities Capacity

Children's most recent Certificate of Need was issued by the Washington State Department of Health (which determines number of inpatient beds) in 2001. The State's Certificate of Need process is intended to: promote, maintain, and assure the health of all citizens in the state; provide access to health services, health manpower and health facilities; and avoid unnecessary duplication and control increases in costs. To gain approval, an applicant must demonstrate that its proposed project is: needed, financially viable, can be operated in conformance with certain quality assurances, and contains costs. In order to obtain a Certificate of Need, an applicant must provide the state with: capital costs refined so as to be within +/-12% of actual at completion; project timeline (project must be commenced within 2 years of approval or the Certificate of Need is forfeited); architectural drawings; demonstration of site control; and documentation that

the proposed site may be used for the proposed project and is appropriately zoned. Because of the requirement that the project construction must commence within 2 years of approval and the site approvals have been obtained, Children's cannot apply for a Certificate of Need until they have obtained approval of their Major Institution Master Plan.

Since the 2001 Certificate of Need was obtained, the patient volumes have increased and the levels of care have intensified as outlined above in Section 2.3.1. According to Children's, the Melinda French Gates Ambulatory Care Building (opened in 2006) is already at capacity. Outpatient visits have grown 11 percent over the last four years, with an increase of 5,000 visits from 2005 to 2006. More outpatient visits lead to increased inpatient admissions, as some of the patients treated in the ambulatory clinics require hospitalization.

As a national standard of care, the recommended average inpatient occupancy level is 65 percent, because pediatric illness is unpredictable (patients with chronic, life-long diseases are more likely to have unplanned admissions) and patients must be admitted to units appropriate to their age and acuity level. Children's currently operates at 75 percent occupancy or above.

2.4 Site and Site Vicinity

Children's is located adjacent to~~in~~ the Laurelhurst and Bryant neighborhoods of Seattle and is 0.5 mile from the Ravenna portion of the University Community Urban Center. The surrounding neighborhood is primarily single family homes, and includes a mixture of multi-family residences, retail/commercial businesses, institutions, and recreational opportunities, such as the Burke-Gilman Trail, Laurelhurst Playground and Magnuson Park. The retail/commercial businesses are located primarily south and west of Children's along Sand Point Way NE, and include University Village, restaurants and shops, an exercise gym, office space, and the Virginia Mason Pediatric Clinic. There are several institutions in the area, including the Children's 70th and Sand Point Way facility, churches, Talaris Research and Conference Center, Laurelhurst Elementary School, and Villa Academy (Figure 1-1). The nearest Major Institution in the area, the University of Washington, is less than a mile to the west.

Children's primary access is via Sand Point Way NE and NE 45th Street to I-5 or to Montlake Boulevard NE and SR 520. Secondary access is via Sand Point Way NE to neighborhoods to the north and Lake City Way (SR 522). Three King County Metro bus stops are located on or adjacent to campus—two are on NE 45th Street and one is on Sand Point Way NE. There are four public pedestrian entrances to the hospital complex. They include: Inpatient (Giraffe) Entrance (northwest corner of the building), Emergency Entrance (north-central portion of the building), Airplane Entrance (northeast corner of the building), and Whale Entrance (east side of the building).

Children's owns the hospital campus and the Hartmann property across Sand Point Way NE (within the proposed Major Institution Overlay (MIO) for Alternatives 3 and 7R). The campus extends roughly 1,250 feet in a north-south direction and 900 feet in an east-west direction. The facilities on site include approximately 900,000 sf of hospital uses. The parking supply includes 1,462 spaces on campus, 80 spaces at Hartmann, and 640 leased spaces at remote lots. In addition, Children's is a part owner of the Springbrook offices at 4500 and 4540 Sand Point Way

NE, where it currently leases approximately 4,200 and 2,500 square feet of space, respectively, for its own use out of the available 49,500 square feet of total rentable space.

2.5 City of Seattle Permitting

2.5.1 Zoning

The underlying zoning for the Children's campus is single family. The existing Master Plan established an MIO that allows institutional uses and heights beyond the underlying single family uses and height limits.

The Hartmann property, located on the west side of Sand Point Way NE, is zoned Lowrise-3 (L-3), a multi-family zone. The City's Comprehensive Plan designates this property as multi-family residential. The property is developed with a one-story clinic and office constructed in 1958, and an 80-space surface parking lot. The clinic and office uses are considered non-conforming uses under Seattle's Land Use Code[2]; the use can continue under existing zoning, but cannot be expanded. Two of the Build Alternatives (Alternatives 3 and 7R) would include the expansion of Children's MIO to include the Hartmann property as part of the MIO. The underlying zoning and comprehensive plan designation for the Hartmann site would not be changed by the City Council's approval of a MIO. ~~Another~~ The other two Build Alternatives (Alternatives 6 and 8) would continue to exclude the site from the MIO. Alternative 6 ~~but~~ would require a rezone of the Hartmann property to Neighborhood Commercial 3 with a 65-foot height limit (NC3-65'). Alternative 8 would continue the use of the Hartmann site as it exists today.

~~The third~~Two Build Alternatives (Alternative 7R and 8) would also include the Laurelon Terrace property to the west of Children's. The underlying zoning for the Laurelon Terrace site is L-3, a multi-family zone. The City's Comprehensive Plan designates the property as multi-family residential. The underlying zoning and comprehensive plan designation for the Laurelon Terrace sites would not be changed by the City Council's approval of a MIO.

2.5.2 Major Institution Overlay (MIO) Designation

The existing MIO district boundaries and heights are shown in Figure 1-3. The zoning of the immediately adjacent properties also is shown. The Children's campus now includes four height districts: 37, 50, 70, and 90 feet. The site generally slopes downward from east to west and from north to south. The existing setbacks are approximately 20 feet on the north, 40 feet on the west and a portion of the east, and 75 feet on the south and a portion of the east. All of the setbacks are heavily landscaped to create a screen between the campus and surrounding neighborhood.

In addition to the MIO height limits, the Seattle City Council further conditioned the heights of two buildings on the campus ~~after~~ as part of its approval of the master plan in 1993. The Janet Sinegal Patient Care Building is located in the MIO 90 area of the campus, and was limited in height to 74 feet with an additional 15 feet allowed for mechanical equipment (a total of 89 feet with mechanical). The Melinda French Gates Ambulatory Care Building is located in an MIO 70 area of the campus and portions of this building were limited in height to 54.5 feet.

[2] A non-conforming use is a use that does not conform to today's Land Use Code, but was lawful when it was established, and has been used continuously since that time.

Children's has submitted an application for a new MIMP. The MIMP approval process includes review and comment by a Citizen's Advisory Committee, the Seattle Departments of Planning and Development, Transportation and Neighborhoods, a hearing before the City's Hearing Examiner, and then a vote by the Seattle City Council. If approved, the MIMP will include a new MIO designating revisions to the existing heights and possibly revisions to the existing MIO boundaries.

2.6 Alternatives

During the summer of 2008, Children's ~~is proposing three~~ considered four build alternatives in addition to the No Build Alternative. The alternatives described in the ~~April~~ August 2008 ~~Draft~~ preliminary Final Master Plan are summarized in Table 2-1 and described in Section 2.6.1 through ~~2.6.5~~2.6.6, and the impacts of each analyzed on Section 3 of this Draft EIS. The alternatives are:

- Alternative 1 - No Build
- Alternative 3 ~~-~~ ~~Proposed~~South Campus Expansion
- Alternative 6 - Modified North Campus Expansion
- Alternative 7R - Expanded Boundary, Early Laurelon Development
- Alternative 8 - Early Laurelon Development without Hartmann

Alternative 7 has been revised and is shown as Alternative 7R. See Section 2.8~~7~~ for a description of how alternatives were developed and which alternatives have been considered but are no longer proposed for analysis.

Children's has considered each of the four Build Alternatives described in the Final EIS and has selected Alternative 7R, Expanded Boundary, Early Laurelon Development as its proposed Final Master Plan.

Table 2-1
Alternatives Proposed in ~~June~~ August 2008 ~~Draft~~ Preliminary Final Master Plan and Analyzed in This ~~DEIS~~ FEIS

	Alternative 1 – No Build	**Alternative 3 ~~-~~ – ~~Proposed~~ South Campus Expansion**	**Alternative 6 – Modified North Campus Expansion**	**Alternative 7R – Expanded Boundary, Early Laurelon Development**	**Alternative 8 – Early Laurelon Development without Hartmann**
Institution Boundary	Existing 21.7-acre site	Existing 21.7-acre site and 1.78-acre Hartmann site (redeveloped)	Existing 21.7-acre site (1.78-acre Hartmann site outside of MIO boundary)	Existing 21.7-acre site, 1.78-acre Hartmann site (redeveloped) and 6.75-acre Laurelon Terrace site (redeveloped)	Existing 21.7-acre site and 6.75-acre Laurelon Terrace site (redeveloped) (1.78-acre Hartmann site outside of MIO boundary)
Total building area within MIO	~900,000 gsf campus	~2.23 million gsf hospital campus; 170,000 gsf Hartmann	~2.23 million gsf hospital campus	~~2.23~~2.25 million gsf hospital campus and Laurelon Terrace; ~~170,000~~150,000 gsf Hartmann	~2.4 million gsf hospital campus and Laurelon Terrace
Leased space outside MIO within 2,500 feet	Springbrook ~~4,000~~6,700 gsf	Pursuant to SMC 23.69.022	Pursuant to SMC 23.69.022	Pursuant to SMC 23.69.022	Pursuant to SMC 23.69.022
Owned space outside MIO within 2,500 feet	Hartmann 16,228 gsf	0 gsf (Hartmann incorporated into Institutional Boundary)	Hartmann 170,000 gsf and re-zoned to NC3 with 65' height	0 gsf (Hartmann incorporated into Institutional Boundary)	Hartmann 16,228 gsf (continuation of existing use)
Uses	Approximately ~~270–272~~250 bed hospital, clinic, clinical research, office, and clinical laboratory; existing clinic and office at Hartmann	500–600 bed hospital, clinic, clinical research, clinical laboratory, office on campus; clinic and office at Hartmann	500–600 bed hospital, clinic, clinical research, clinical laboratory, office on campus; clinic and office at Hartmann	500–600 bed hospital, clinic, clinical research, clinical laboratory, office on campus; clinic and office at Hartmann	500–600 bed hospital, clinic, clinical research, clinical laboratory, office on campus; existing clinic and office at Hartmann

Table 2-1
Alternatives Proposed in ~~June~~ August 2008 ~~Draft~~ Preliminary Final Master Plan and Analyzed in This ~~DEIS~~ FEIS (continued)

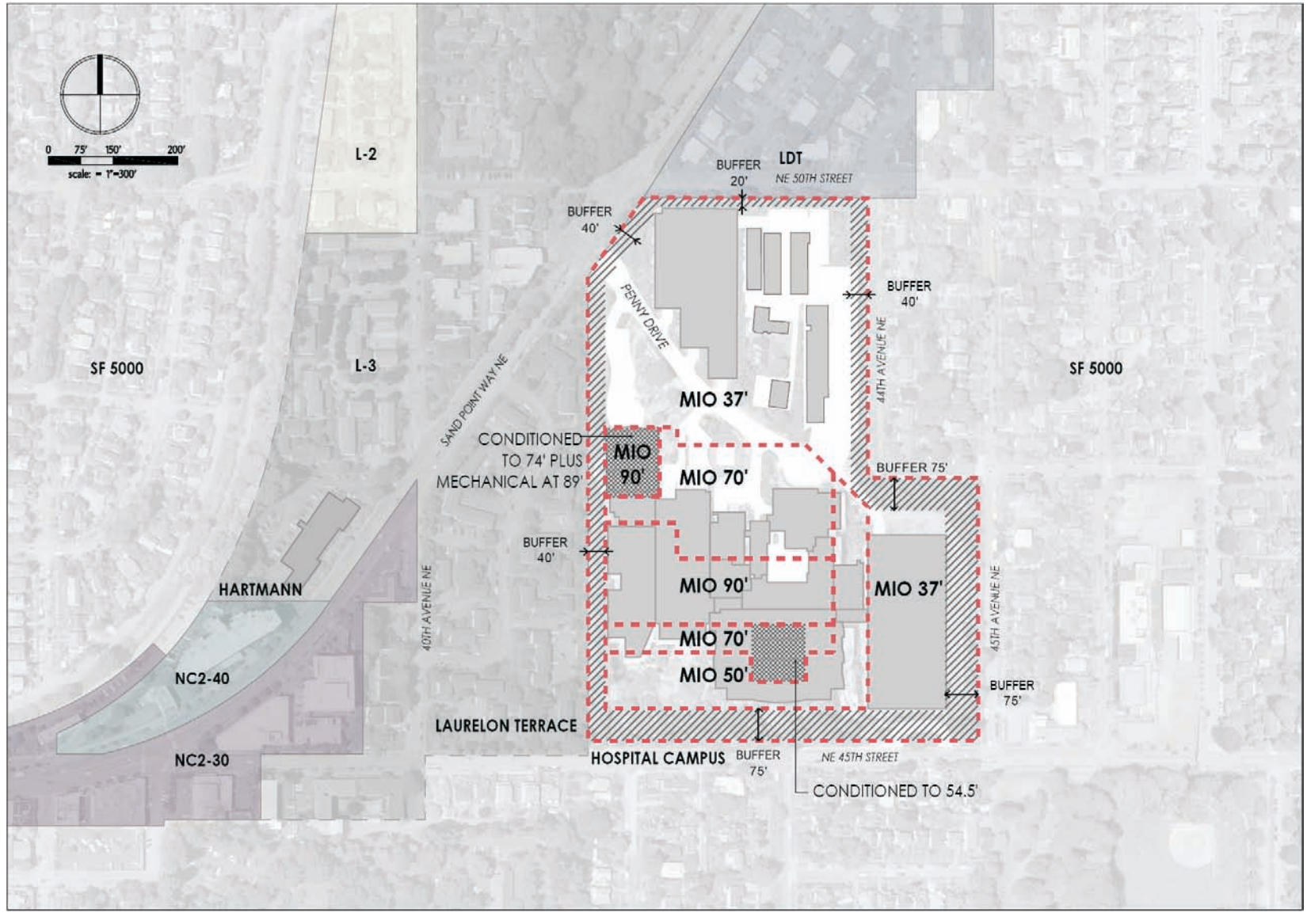
	Alternative 1 – No Build	**Alternative 3 – ~~Proposed~~ South Campus Expansion**	**Alternative 6 – Modified North Campus Expansion**	**Alternative 7R – Expanded Boundary, Early Laurelon Development**	**Alternative 8 – Early Laurelon Development without Hartmann**
Street vacations	None	None	None	41st Avenue NE and NE 46th Street between Sand Point Way and 40th Avenue NE	41st Avenue NE and NE 46th Street between Sand Point Way and 40th Avenue NE
Parking	~2,182 total stalls: 1,462 on hospital campus 80 at Hartmann 640 off-campus	~3,600 total stalls: 2,570 on hospital campus 530 at Hartmann 500 off-campus	~3,600 total: 2,845 on hospital campus 255 at Hartmann 500 off-campus	~3,600 total: ~~2,845~~2,875 on expanded hospital campus ~~255~~ 225 at Hartmann 500 off-campus	~3,600 total: 3,100 on expanded hospital campus 500 off-campus
Parking location (amount)	Whale (608) and Giraffe (728) Garages; surface (97) lots; miscellaneous loading (30); Hartmann (80) surface); off-campus (640) leased parking	Whale Garage (608); new garage on north portion of the campus to replace existing Giraffe Garage (1962); new underground parking at Hartmann (530); off-campus leased parking (500)	Whale Garage (608); new garage on north portion of the campus to replace existing Giraffe Garage (2237); new underground parking at Hartmann (255); off-campus leased parking (500)	Whale Garage (608); new garage on north portion of the campus to replace existing Giraffe Garage (~~1332~~1,167); new above-ground structured parking at Laurelon Terrace (~~905~~1,100), new underground parking at Hartmann (~~255~~225); off-campus leased parking (500)	Whale Garage (608); new garage on north portion of the campus to replace existing Giraffe Garage (1,279); new above-ground structured parking at Laurelon Terrace (1,213), off-campus leased parking (500)

Table 2-1
Alternatives Proposed in ~~June~~ August 2008 ~~Draft~~ Preliminary Final Master Plan and Analyzed in This ~~DEIS~~ FEIS (continued)

	Alternative 1 – No Build	Alternative 3 – ~~Proposed~~ South Campus Expansion	Alternative 6 – Modified North Campus Expansion	Alternative 7R – Expanded Boundary, Early Laurelon Development	Alternative 8 – Early Laurelon Development without Hartmann
Access	1 primary access: Sand Point Way NE (existing): full movements	3 campus access points: Sand Point Way NE (existing), full movements; NE 50th Street, right in, left out; NE 45th Street, shuttle only left in/right out Hartmann (1 access), full movements	3 campus access points: Sand Point Way NE (existing), full movements; NE 50th Street, right in, left out; NE 45th Street: shuttle only left in/right out Hartmann (1 access): full movements	3 campus access points: ~~(2)~~ Sand Point Way NE (existing full movements ~~& new right in/right out~~): ~~full movements;~~ 2 on 40th Avenue NE, full movements Hartmann (1 access): full movements	3 campus access points: Sand Point Way NE (existing full movements): and 2 on 40th Avenue NE, full movements
Height limit for MIO					
Campus – North of Penny Drive	MIO of 37’	MIO of 50’	MIO of 37’, 50’, 65’ and 90’	MIO of 37’ and ~~50’~~65’	MIO of 37’ and 65’
Campus – South of Penny Drive	MIO of 37', 50', 70', and 90'	MIO of 37', 50', 70', 90' and 105' on the east, MIO of 37', 50', 90', 105' and 160' on the west	MIO of 37’, 50’, 65’, 70’, and 90’ on the east; MIO of 37’, 50’, 70’, 90’, and 160’ on the west	MIO of 37', 50’, 70' and 90' on the east, MIO of 50', 70’, 90' and 160' on the west	MIO of 37', 50’, 70' and 90' on the east, MIO of 50', 70’, 90' and 160' on the west
Laurelon Terrace	L-3 Zoning with 37’ (outside the MIO)			Laurelon Terrace site developed at MIO of 37’, 50' and 160'	Laurelon Terrace site developed at MIO of 37’, 50' and 160’
Hartmann Site	L-3 Zoning with 30 to 35’ Continuation of existing non-conforming use	Hartmann site developed at MIO 50' to 105'	Hartmann re-zoned to NC3 with 65’, outside of MIO	Hartmann site developed at MIO 65’.	L-3 Zoning with 30 to 35’ Continuation of existing non-conforming use

gsf – gross square feet
SMC – Seattle Municipal Code

(page intentionally left blank)



Source: Zimmer Gunsul Frasca Architects LLP

Figure 2-1 rev
Alternative 1 - No Build

2.6.1 Alternative 1 – No Build

Alternative 1 has been studied to compare potential impacts of the Proposal and other Build Alternatives (Alternatives 3, 6, ~~and~~ 7R and 8). Alternative 1 considers potential conditions in approximately 20 years (2030) if Children's were to build all of the square footage allowed under their existing Major Institution Master Plan. The existing height limits or MIO of the campus would remain (Figure 2-1). Children's could demolish and replace existing buildings but no increase in total developed area would occur.

The 1994 Master Plan included 16 projects totaling 262,630 sf of additional space plus a new parking structure (Whale Garage). All but approximately 54,000 sf of this development has been completed. The addition of 54,000 sf would be permitted under the existing Master Plan.~~Approximately 20,000 – 25,000 square feet of the remaining development is under design for an additional floor to be added to the top of the Train building and anticipated to be submitted to the City for review in summer 2008. The expansion would provide space for approximately 20 to 22 inpatient beds.~~

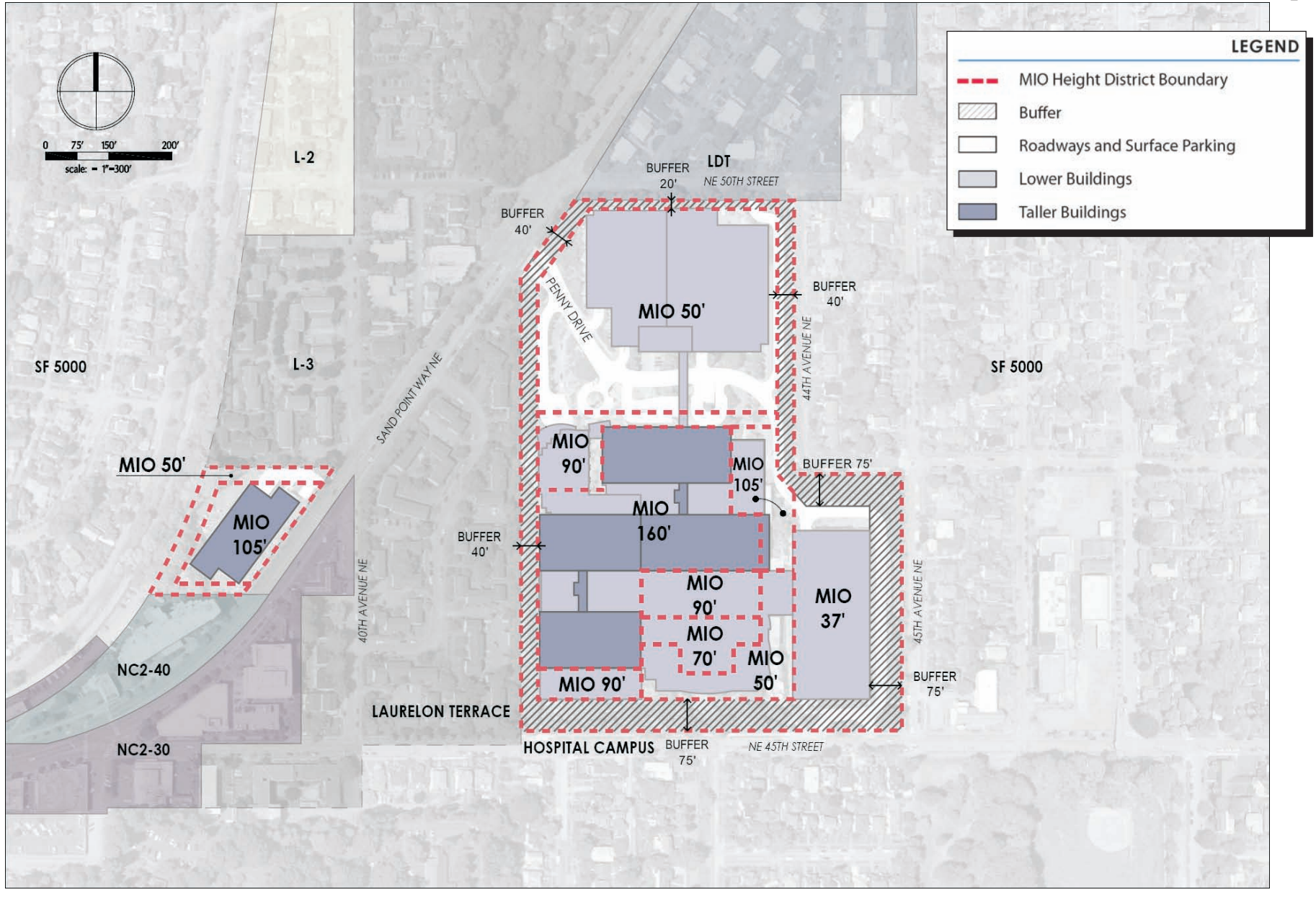
~~It is anticipated that construction of the Train building expansion would begin in October 2008 and be completed by November 2009. The Emergency Department would remain in its current location until construction of the first phase of one of the Build Alternatives being considered for the new MIMP~~.

2.6.2 Design Elements Common to All Build Alternatives

Each of the build alternatives would result in a similar program for Children's: 500–600 bed hospital, clinic, research, clinical laboratory, and office with an increase in approximately 1,330,000 to 1,500,000 sf for a total of 2,230,000 to 2,400,000 sf on campus. All alternatives would include the relocation of internal access for inpatient, emergency and loading. The mechanical and electrical components would be incorporated and coordinated within each building during the build out of the campus. The existing Central Utility Plant could remain to serve the existing buildings.

Children's could continue to lease space in the area pursuant to the Seattle Municipal Code (SMC) regulations for a Major Institution (SMC 23.69.022).

33759484_95.cdr



Source: Zimmer Gunsul Frasca Architects LLP

Figure 2-2
Alternative 3 - South Campus Expansion

2.6.3 Alternative 3 – ~~Proposed~~South Campus Expansion

2.6.3.1 Proposed Changes to MIO Districts

The following changes are proposed to the MIO districts for the campus under Alternative 3 compared to the existing master plan. No changes to existing building setbacks or to the existing MIO 37 around the perimeter of the campus are proposed (Figure 2-2).

1. On campus, the existing MIO 37 district to the north would be changed to MIO 50.
2. A portion of the existing MIO 50 district would be changed to MIO 90 near the south edge of the site. A portion of the existing MIO 37 district above the Whale Garage and along Penny Drive would be changed to MIO 105. A portion of the existing MIO 70 district between the Pavilion and the Janet Sinegal Patient Care Building would be changed to MIO 90. These districts provide a transition on the north, east, and south edges of the MIO 160 district down to the MIO 50 district and restrict building heights in this area as the site topography rises in elevation.
3. A portion of the existing MIO 50 district to the south, the existing MIO 70 and MIO 90 districts would be changed to MIO 160 in the consolidated southwestern core area of the site.

2.6.3.2 MIO Boundary

The MIO boundary is proposed to be expanded to include the Hartmann property. The MIO would change the height currently allowed in the L-3 Zone (30-35 feet) to MIO 105 for the center of the site with a surrounding transition district of MIO 50.

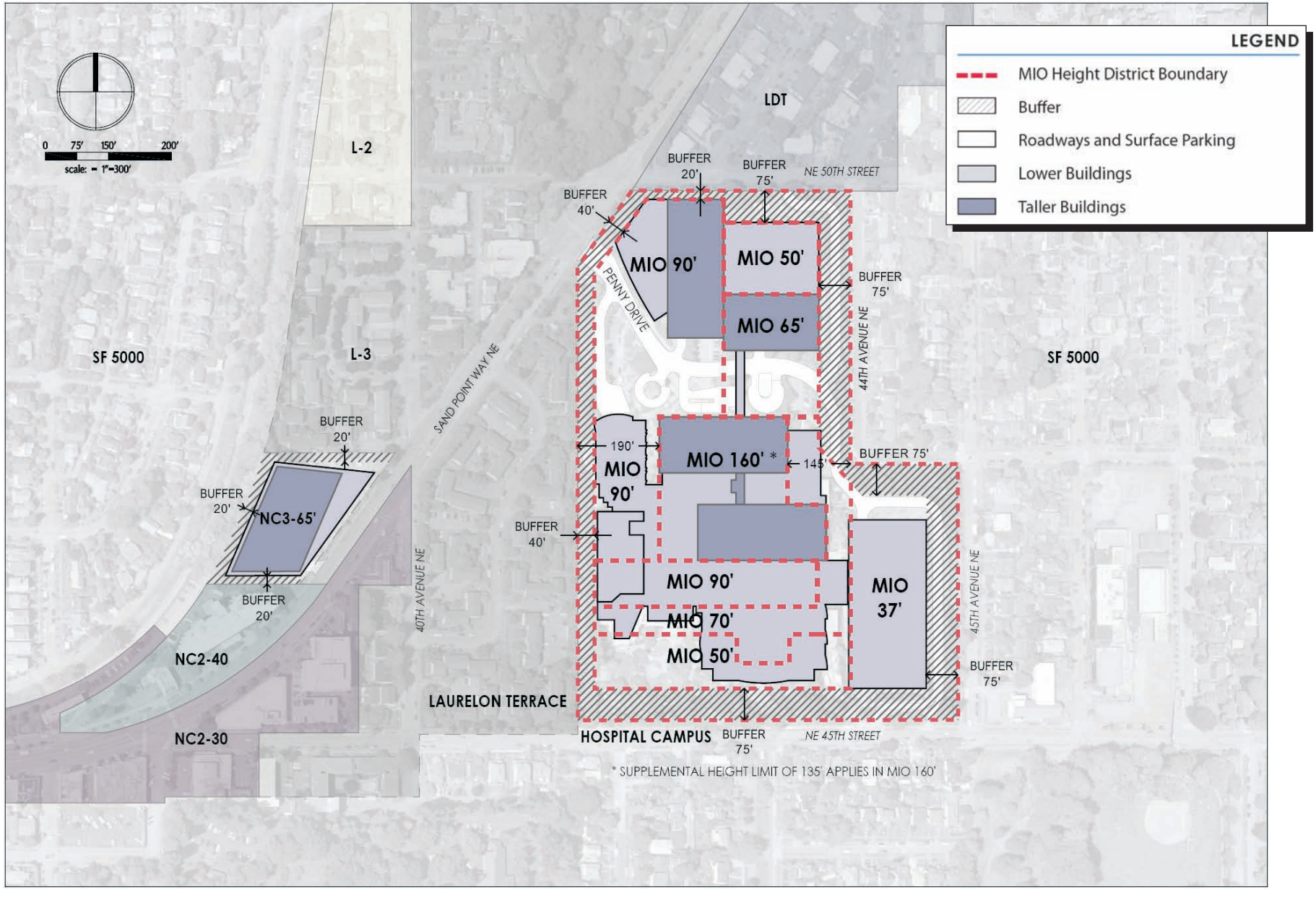
2.6.3.3 Site Access

Site access would be provided at 3 access points: Sand Point Way NE (existing) with full movements; NE 50th Street with right in, left out; and NE 45th Street for shuttle only with right in, left out.

~~2.6.3.4Construction Phasing~~

~~It is anticipated that construction of the first phase of Alternative 3 would begin with demolition of the south end of the Giraffe Garage and relocation of Penny Drive to the north. The existing helipad would be moved to a temporary location, immediately followed by the excavation and construction for the first phase building which would also include a new Emergency Department. Depending on construction sequencing, the helipad may then be moved to a second temporary location. When the first phase building is completed, the helipad would move to the top of the new facility. The location and potential noise from the temporary and permanent locations for the helipad are described in Section 3.5, Noise.~~

33759484_96.cdr



Source: Zimmer Gunsul Frasca Architects LLP

Figure 2-3

Alternative 6 - Modified North Campus Expansion

2.6.4 Alternative 6 – Modified North Campus Expansion

2.6.4.1 Proposed Changes to MIO Districts

The following changes are proposed to the MIO districts for the campus under Alternative 6 compared to the existing master plan. (Figure 2-3).

1. On campus north of Penny Drive, the existing MIO 37 district would be changed to three MIOs, including MIO 50, MIO 65, and MIO 90. The existing buffer along the northeast corner would be increased to 75 feet.
2. The MIO 37 district that exists on the southeastern portion of the site and along the entire perimeter would remain.
3. In the southern portion of the campus, the MIO 50 would remain except on the eastern edge where it would be replaced by MIO 70. The MIO 70 district would be expanded to the east and north. The MIO 90 district would remain along the western edge of the campus but would be reduced in the center of the campus.
4. In the center of the campus south of Penny Drive, the existing MIO 70 district would be changed to MIO 160 in order to consolidate the new development and height in the center of the campus. The MIO 160 would be conditioned to a height of approximately 145 feet to accommodate the actual height needed for planned development including mechanical and elevator penthouses.

2.6.4.2 MIO Boundary

In Alternative 6, the MIO boundary would not be expanded to include the Hartmann property. Instead, Children's would request a rezone of the Hartmann site to Neighborhood Commercial 3 (NC3) with a height limit of 65 feet. The site would be redeveloped consistent with uses allowed in an NC3 zone.

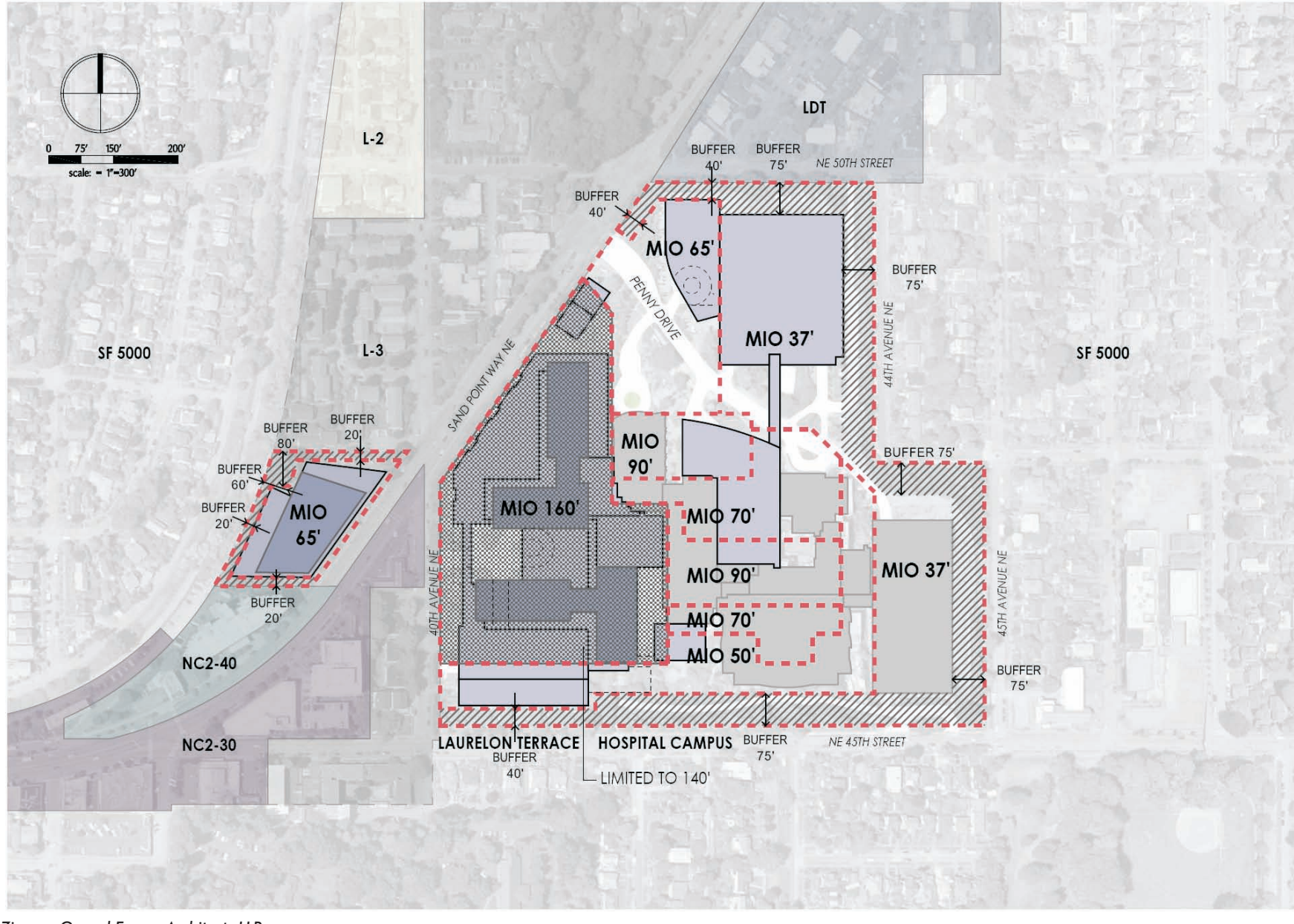
2.6.4.3 Site Access

Site access would be provided at 3 access points: Sand Point Way NE (existing) with full movements; NE 50th Street with right in, left out; and NE 45th Street for shuttle only with right in, left out.

~~2.6.4.4Construction Phasing~~

~~The site preparation for the construction of Alternative 6 would be the same as for Alternative 3. It is anticipated that construction of the first phase of Alternative 6 would begin with demolition of the south end of the Giraffe Garage and relocation of Penny Drive to the north. The existing helipad would be moved to a temporary location, immediately followed by the excavation and construction for the first phase building which would also include a new Emergency Department. Depending on construction sequencing, the helipad may then be moved to a second temporary location. When the first phase building is completed, the helipad would move to the top of the new facility. The location and potential noise from the temporary and permanent locations for the helipad are described in Section 3.5, Noise.~~

33759484_151.cdr



Source: Zimmer Gunsul Frasca Architects LLP

Figure 2-4 rev

Alternative 7R - Expanded Boundary, Early Laurelon Development

2.6.5 Alternative 7R – Expanded Boundary, Early Laurelon Development

2.6.5.1 Proposed Changes to MIO Districts

The following changes are proposed to the MIO districts for the campus under Alternative 7R compared to the existing master plan.

1. The Children's MIO would be expanded to include both the Laurelon Terrace property and the Hartmann property.
2. As development occurs, a 75-foot buffer would be maintained along NE 50th Street, 44th Avenue NE, 45th Avenue NE, and along NE 45th Street to the southwestern corner of the existing Children's campus. At that point, the 75-foot buffer would transition to a ~~60~~40-foot buffer along NE 45th Street to the corner of 40th Avenue NE (the new southwest corner of the expanded site).
3. Along the western edge of the expanded property facing 40th Avenue NE and Sand Point Way NE, no buffer is proposed.
4. North of Penny Drive, the western half of the site would be changed from MIO 37 to MIO ~~50~~65. The MIO 37 on the eastern half would remain.
5. South of Penny Drive, the existing MIO heights would remain on the existing campus much as they exist today with ~~two~~ four exceptions. The MIO 37 buffer along the western edge of the campus that separates Children's from Laurelon Terrace would be eliminated, ~~and~~ the MIO 90 district would be expanded to the east into the center of the campus, and portions of the MIO 90 and 70 districts in the center of the campus that abut the existing Laurelon Terrace property would be increased to MIO 160 as part of the MIO 160 district proposed for the Laurelon Terrace site.

2.6.5.2 MIO Boundary

The existing MIO is proposed to be expanded to include both the Laurelon Terrace property and the Hartmann property (revised Figure 2-4). The MIO proposed for the Laurelon Terrace property would change the 30 – 35 foot height currently allowed in the L-3 Zone to MIO 37, 50 and 160. With the inclusion of the Hartmann property in the MIO, Children's is proposing a change in height from that currently allowed in the L-3 Zone (30–35 feet) to MIO 65.

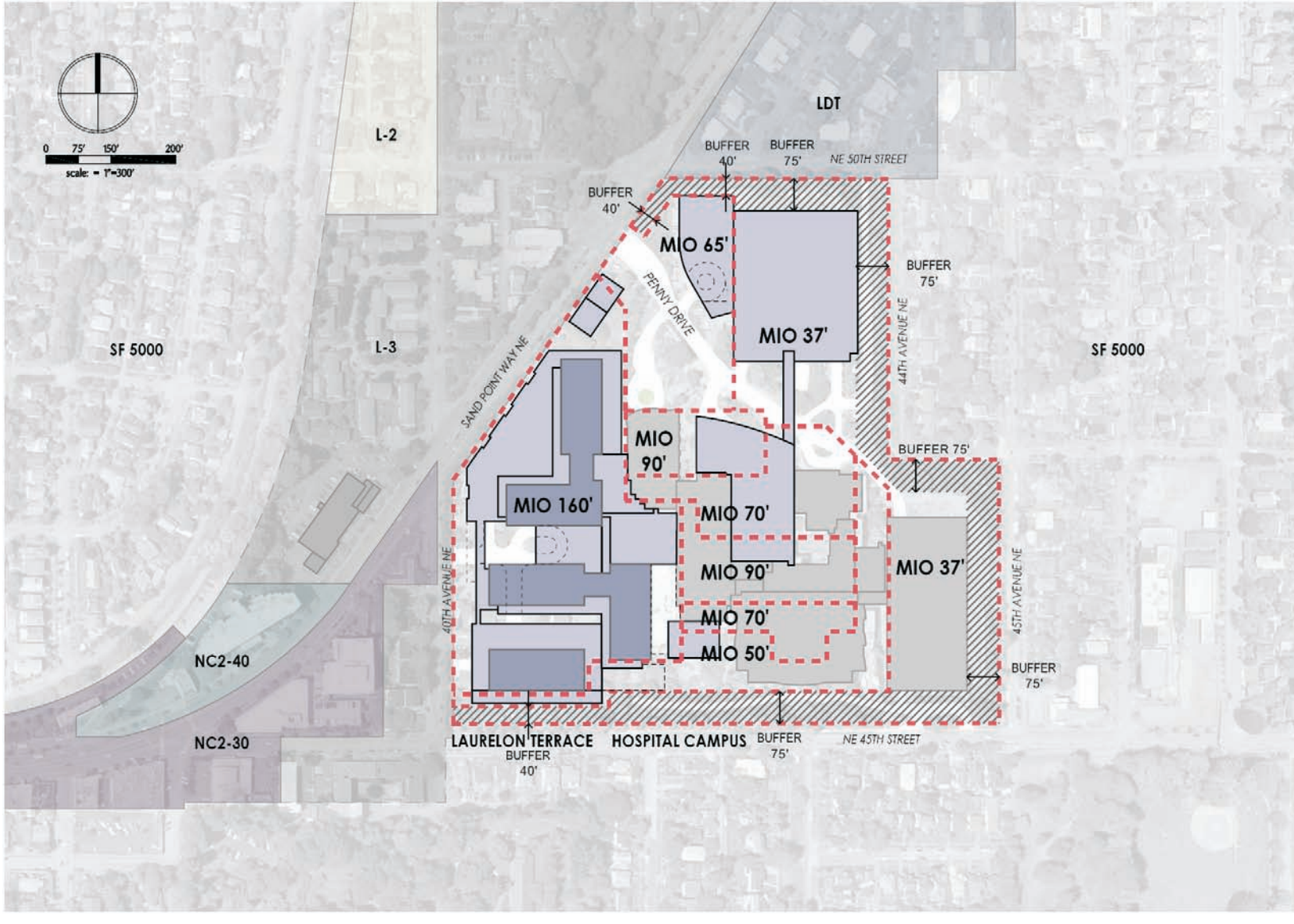
2.6.5.3 Site Access

Site access would be provided at three access points: Sand Point Way NE (existing ~~and new~~) with full movements; and two new access points on 40th Avenue NE with full movements.

~~2.6.5.4Construction Phasing~~

~~The site preparation for the construction of Alternative 7 would begin with the demolition of the existing Laurelon Terrace condominiums. Penny Drive would remain in its current location and would not be relocated to the north as proposed for Alternatives 3 and 6. The existing helipad would remain in its existing location on campus. When the first phase building is completed, the helipad would move to the top of the new facility. The location and potential noise from the existing and future locations for the helipad are described in Section 3.5, Noise.~~

33759484_152.cdr



Source: Zimmer Gunsul Frasca Architects LLP

Figure 2-4a

Alternative 8 - Early Laurelon Development without Hartmann

2.6.6 Alternative 8 - Early Laurelon Development Without Hartmann

2.6.6.1 Proposed Changes to MIO Districts

The following changes are proposed to the MIO districts for the campus under Alternative 8 compared to the existing master plan.

1. The Children's MIO would be expanded to include only the Laurelon Terrace property. The Hartmann property would remain outside the MIO.
2. As development occurs, a 75-foot buffer would be maintained along NE 50th Street, 44th Avenue NE, and along NE 45th to the southwestern corner of the existing Children's campus. At that point, the 75-foot buffer would transition to a 40-foot buffer along NE 45th Street to the corner of 40th Avenue NE (the new southwest corner of the expanded site).
3. Along the western edge of the expanded property facing 40th Avenue NE and Sand Point Way NE, no buffer is proposed.
4. North of Penny Drive, the western half of the site would be changed from MIO 37 to MIO 65. The MIO 37 on the eastern half would remain.
5. South of Penny Drive, the existing MIO heights would remain on the existing campus much as they exist today with four exceptions. The MIO 37 buffer along the western edge of the campus that separates Children's from Laurelon Terrace would be eliminated, the MIO 90 district would be expanded to the east into the center of the campus, and portions of the MIO 90 and 70 districts in the center of the campus that abut the existing Laurelon Terrace property would be increased to MIO 160 as part of the MIO 160 district proposed for the Laurelon Terrace site.

2.6.6.2 MIO Boundary

The existing MIO is proposed to be expanded to include only the Laurelon Terrace property (Figure 2-4a). The MIO proposed for the Laurelon Terrace property would change the 30 – 35 foot height currently allowed in the L-3 Zone to MIO 37, 50 and 160.

2.6.6.3 Site Access

Site access would be provided at three access points: Sand Point Way NE (existing) with full movements; and two new access points on 40th Avenue NE with full movements.

2.7 Construction Phasing

Children's is proposing a Master Plan for development through the year 2030. Construction would occur on the campus in ~~either three phases (for Alternative 7) or in~~ four phases ~~(for Alternatives 3 and 6)~~. For ~~each of the a~~Alternatives 3, 6 and 7R, redevelopment of the Hartmann site would occur as part of Phase 2. It is anticipated that Bed Units 1 and 2 may contain more beds than Bed Units 3 and 4, depending on whether the hospital is constructed with 24, 36, or 48 beds per floor. Size of bed units will also depend on the demonstrated need at the time of submitting each application to the state Department of Health for a Certificate of Need. The anticipated phasing for each alternative is shown in revised Figure 2-5.

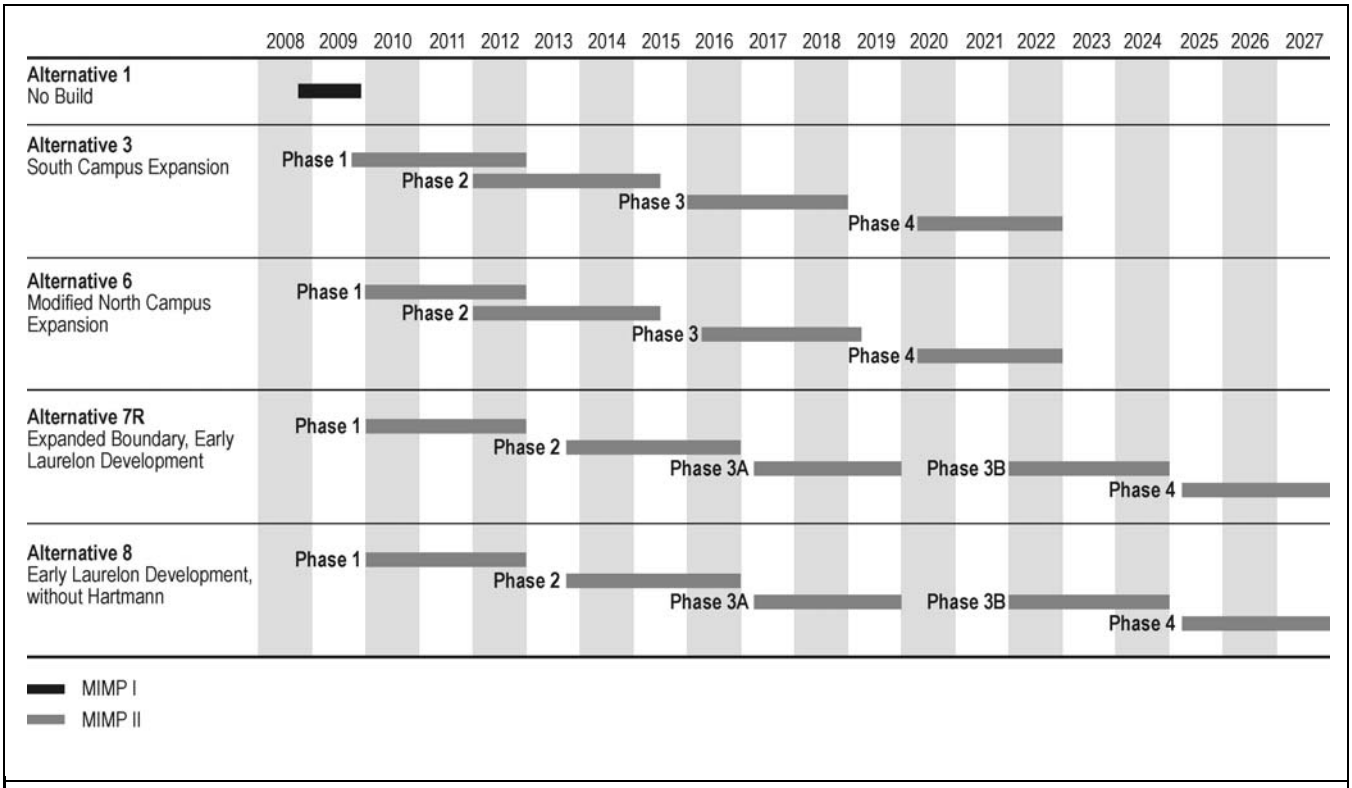


Figure 2-5 (rev)
Construction Phasing

2.7.1 Alternative 1 – No Action

~~Children's is proposing to add an additional floor to the Train building to provide space for approximately 20 to 22 inpatient beds. This proposal would use approximately 20,000 to 25,000 sf of the 54,000 sf of remaining unbuilt space that was approved in their existing MIMP, potentially subject to amendment. Children's anticipates submitting the Master Use Permit in the summer of 2008. If approved, construction would begin in October 2008 and be completed in November 2009.~~ Children's has 54,000 square feet of remaining unbuilt space that was approved in their existing MIMP. This space can still be constructed.

2.7.2 Alternative 3 ~~and Alternative 6~~

~~Under either Alternative 3 or Alternative 6, build-out of the campus would be developed in four phases (Bed Units 1, 2, 3 and 4) over the next 15 to 20 years. Construction of Bed Unit 1 could begin in the first quarter of 2010 and be completed in the fourth quarter of 2012. At that time the helipad would be moved from its temporary location on campus to the roof of Bed Unit 1. It is anticipated that Bed Units 1 and 2 may contain more beds than Bed Units 3 and 4, depending on whether the hospital is constructed with 24 or 36 beds per floor. Size of bed units will also depend on the demonstrated need at the time of submitting each application to the state Department of Health for a Certificate of Need.~~It is anticipated that construction of the first phase of Alternative 3 would begin with demolition of the south end of the Giraffe Garage and relocation of Penny Drive to the north. The existing helipad would be moved to a temporary on-site location approximately 300 feet east-northeast of the current site, immediately followed by the excavation and construction for the first phase building which would also include a new Emergency Department. Depending on construction sequencing, the helipad may then be moved to a second temporary on-site location within 300 feet northwest of the current site. When the first phase building is completed, the helipad would move to the top of the new facility. The location and potential noise from the temporary and permanent locations for the helipad are described in Section 3.5, Noise.

2.7.2.1 Alternative 3 - Phase 1

Phase 1 construction at Children's would include a new Emergency Department, Bed Unit 1 and Diagnostic and Therapeutic. Phase 1 would expand the hospital (including ancillary, mechanical and general plant) to a total of approximately 1,458,000 square feet. For purposes of this estimate, it is assumed to be built between 4th quarter, 2009 and 4th quarter, 2012. Phase 1 includes a garage that would increase parking to 2,530 spaces and would be built between 3rd quarter, 2010 and 2nd quarter 2012. Approximately 135,000 total cubic yards of soil would be excavated and removed from the site.

2.7.2.2 Alternative 3 - Phase 2

Phase 2 construction would include the Hartmann Building, Bed Unit 2 and Diagnostic and Therapeutic, and would expand the hospital (including ancillary, mechanical and general plant) to a total of approximately 1,838,000 square feet. For purposes of this estimate, it is assumed to be built between 1st quarter, 2012 and 2nd quarter, 2015. Phase 2 also includes a garage, but because of land taken for the buildings, parking would decrease to 2,430 spaces. The garage would be built between 4th quarter, 2011 and 2nd quarter, 2013. Approximately 263,000 total cubic yards of soil would be excavated and removed from the site for Phase 2.

2.7.2.3 Alternative 3 - Phase 3

Phase 3 construction would include Bed Unit 3 and Diagnostic and Therapeutic, and would expand the hospital (including ancillary, mechanical and general plant) to a total of approximately 2,046,000 square feet. For purposes of this estimate, it is assumed to be built between 1st quarter, 2016 and 4th quarter, 2018. Phase 3 also includes a garage that would increase parking to 3,530 spaces. Approximately 16,000 total cubic yards of soil would be excavated and removed from the site.

2.7.2.4 Alternative 3 - Phase 4

Phase 4 would include Bed Unit 4 and Diagnostic and Therapeutic, and would expand the hospital (including ancillary, mechanical and general plant) to a total of 2,393,000 square feet. For purposes of this estimate, it is assumed to be built between 2nd quarter, 2020 and 4th quarter, 2022. Phase 4 would not include a garage so parking would remain at 3,530 spaces. Approximately 21,000 total cubic yards of soil would be excavated and removed from the site.

Table 2-1a summarizes the construction activities of each phase for Alternative 3.

Table 2-1a
Summary of Construction Activities of Each Phase for Alternative 3

	Alternative 3			
	Phase 1 includes ED	Phase 2	Phase 3	Phase 4
	1st Qtr 2010 – 4th Qtr 2012	1st Qtr 2012 – 2nd Qtr 2015	1st Qtr 2016 – 4th Qtr 2018	2nd Qtr 2020 – 4th Qtr 2022
Square Footage Added	623,000	499,000	208,000	347,000
Demolition (sf)	65,000	119,000	0	0
Parking Added (spaces)	1,139	-100	1,100	0
Soil excavation and removal (cu yds)	135,000	263,000	16,000	21,000

2.7.3 Alternative 6

The site preparation for the construction of Alternative 6 would be the same as for Alternative 3. It is anticipated that construction of the first phase of Alternative 6 would begin with demolition of the south end of the Giraffe Garage and relocation of Penny Drive to the north. The existing helipad would be moved to a temporary on-site location approximately 300 feet east-northeast of the current site, immediately followed by the excavation and construction for the first phase building which would also include a new Emergency Department. Depending on construction sequencing, the helipad may then be moved to a second temporary on-site location within 300 feet northwest of the current site. When the first phase building is completed, the helipad would move to the top of the new facility. The location and potential noise from the temporary and permanent locations for the helipad are described in Section 3.5, Noise.

2.7.3.1 Alternative 6 - Phase 1

Phase 1 construction at Children's would include a new Emergency Department, Bed Unit 1 and Diagnostic and Therapeutic. Phase 1 would expand the hospital (including ancillary, mechanical and general plant) to a total of approximately 1,225,000 square feet. For purposes of this estimate, it is assumed to be built between 1st quarter, 2010 and 4th quarter, 2012. Phase 1 includes a 780 stall garage that would be built between 3rd quarter, 2010 and 2nd quarter 2012. Approximately 191,000 total cubic yards of soil would be excavated and removed from the site. Approximately 65,000 square feet of existing buildings would be demolished.

2.7.3.2 Alternative 6 - Phase 2

Phase 2 construction would include the Hartmann Building, Bed Unit 2 and Diagnostic and Therapeutic, and would expand the hospital (including ancillary, mechanical and general plant) to a total of approximately 1,712,000 square feet. For purposes of this estimate, it is assumed to be built between 1st quarter, 2012 and 2nd quarter, 2015. Phase 2 also includes a 255 stall garage. The garage would be built between 2nd quarter, 2012 and 2nd quarter, 2013. Approximately 246,000 total cubic yards of soil would be excavated and removed from the site for Phase 2. Approximately 119,000 square feet of existing buildings would be demolished.

2.7.3.3 Alternative 6 - Phase 3

Phase 3 construction would include Bed Unit 3 and Diagnostic and Therapeutic, and would expand the hospital (including ancillary, mechanical and general plant) to a total of approximately 1,932,000 square feet. For purposes of this estimate, it is assumed to be built between 2nd quarter, 2016 and 1st quarter, 2019. Approximately 75,000 total cubic yards of soil would be excavated and removed from the site.

2.7.3.4 Alternative 6 - Phase 4

Phase 4 would include Bed Unit 4 and Diagnostic and Therapeutic, and would expand the hospital (including ancillary, mechanical and general plant) to a total of 2,425,000 square feet. For purposes of this estimate, it is assumed to be built between 2nd quarter, 2020 and 4th quarter, 2022. A parking garage with 807 stalls would be included. Approximately 153,000 total cubic yards of soil would be excavated and removed from the site.

Table 2-1b summarizes the construction activities of each phase for Alternative 6.

Table 2-1b
Summary of Construction Activities of Each Phase for Alternative 6

	Alternative 6			
	Phase 1 including ED	Phase 2	Phase 3	Phase 4
	1st Qtr 2010 – 4th Qtr 2012	1st Qtr 2012 – 2nd Qtr 2015	2nd Qtr 2016 – 1st Qtr 2019	2nd Qtr 2020 – 4th Qtr 2022
Square Footage Added	390,000	606,000	220,000	493,000
Demolition (sf)	65,000	119,000	0	0
Parking Added (spaces)	780	255	0	807
Soil excavation and removal (cu yds)	191,000	246,000	75,000	153,000

~~2.7.3~~2.7.4 Alternative 7R

Under Alternative 7R, build-out of the campus would be developed in ~~three~~ four phases (Bed Units 1, 2 and 3, and garage/office) over the next ~~15 to~~ 20 years. Construction of Bed Units 1 and

2 could begin in the ~~third~~ first quarter of 2010 and be completed in the ~~third~~ fourth quarter of 2012. At that time the helipad would be moved from its existing site on campus to the roof of Bed Unit 1. It is anticipated that Bed Units 1 and 2 may contain more beds than Bed Unit~~s~~ 3 ~~and 4~~, depending on whether the hospital is constructed with 24, ~~or~~ 36, or 48 beds per floor. Size of bed units will also depend on the demonstrated need at the time of submitting each application to the state Department of Health for a Certificate of Need.

The site preparation for the construction of Alternative 7R would begin with the demolition of the existing Laurelon Terrace condominiums. Penny Drive would remain in its current location and would not be relocated to the north as proposed for Alternatives 3 and 6. The existing helipad would remain in its existing location on campus. When the first phase building is completed, the helipad would move to the top of the new facility. The location and potential noise from the existing and future locations for the helipad are described in Section 3.5, Noise.

2.7.4.1 Alternative 7R - Phase 1

Phase 1 construction at Children's would include a new Emergency Department, Bed Units 1 and 2 and Diagnostic and Therapeutic. Phase 1 would expand the hospital (including ancillary, mechanical and general plant) to a total of approximately 1,492,000 square feet. For purposes of this estimate, it is assumed to be built between 4th quarter, 2009 and 4th quarter, 2012. Approximately 72,000 total cubic yards of soil would be excavated and removed from the site.

The existing Laurelon Terrace buildings would be demolished, totaling approximately 110,000 square feet. During the demolition of the existing housing units at Laurelon Terrace, there is a potential for lead paint or asbestos to be found due to the age of the buildings. The Puget Sound Clean Air Agency requires, prior to demolition, that an asbestos survey be performed and an abatement plan be developed to prevent the releases into the atmosphere and to protect worker safety.

2.7.4.2 Alternative 7R - Phase 2

Phase 2 construction would include the Hartmann Building and Diagnostic and Therapeutic, and would expand the hospital (including ancillary, mechanical and general plant) to a total of approximately 1,754,000 square feet. For purposes of this estimate, it is assumed to be built between 4th quarter, 2013 and 4th quarter, 2016. Phase 2 also includes a 255 stall garage on the Hartmann site and a 1,100 staff garage on the Laurelon Terrace site. The garages would be built between 1st quarter, 2014 and 3rd quarter, 2015. Approximately 156,000 total cubic yards of soil would be excavated and removed from the site for Phase 2. Approximately 65,000 square feet of existing buildings would be demolished.

2.7.4.3 Alternative 7R - Phase 3

Phase 3 construction would include Bed Units 3 and 4 and Diagnostic and Therapeutic, and would expand the hospital (including ancillary, mechanical and general plant) to a total of approximately 2,210,000 square feet. For purposes of this estimate, it is assumed to be built in two subphases. Subphase 3A would be constructed between 2nd quarter, 2017 and 4th quarter, 2019. Subphase 3B would be constructed between 1st quarter, 2022 and 4th quarter, 2024. Approximately 98,000 total cubic yards of soil would be excavated and removed from the site.

2.7.4.4 Alternative 7R - Phase 4

Phase 4 would include the demolition of the Giraffe Garage, and construction of the North Garage in two phases, and offices, and would expand the hospital (including ancillary, mechanical and general plant) to a total of approximately 2,357,000 square feet. For purposes of this estimate, it is assumed to be built between 2nd quarter, 2025 and 4th quarter, 2027. Approximately 172,000 total cubic yards of soil would be excavated and removed from the site.

Table 2-1c summarizes the construction activities of each phase for Alternative 7R.

Table 2-1c
Summary of Construction Activities of Each Phase for Alternative 7R

	Alternative 7R			
	Phase 1 Including ED	**Phase 2**	**Phase 3A and 3B**	**Phase 4**
	1st Qtr 2010 – 4th Qtr 2012	**4th Qtr 2013 – 4th Qtr 2016**	**2nd Qtr 2017 – 4th Qtr 2019** **1st Qtr 2022 - 4th Qtr 2024**	**2nd Qtr 2025 – 4th Qtr 2027**
Square Footage Added	592,000	327,000 (including 150,000 at Hartmann)	592,000 (two construction phases)	147,000
Demolition (sf)	Laurelon Terrace (approximately 110,000)	65,000 (D Wing 47,000 F Wing 18,000)	136,000 (Train)	169,000 (Giraffe Garage)
Parking Added (spaces)	300 surface stalls on Laurelon Site	1,100 Laurelon Garage 255 Hartmann	0	1,167 North Garage Expansion
Soil excavation and removal (cu yds)	72,000	156,000	98,000	172,000

2.7.5 Alternative 8

The site preparation for the construction of Alternative 8 would begin with the demolition of the existing Laurelon Terrace condominiums. Penny Drive would remain in its current location and would not be relocated to the north as proposed for Alternatives 3 and 6. The existing helipad would remain in its existing location on campus. When the first phase building is completed, the helipad would move to the top of the new facility. The location and potential noise from the existing and future locations for the helipad are described in Section 3.5, Noise.

2.7.5.1 Alternative 8 - Phase 1

Phase 1 construction at Children's would include a new Emergency Department, Bed Units 1 and 2 and Diagnostic and Therapeutic. Phase 1 would expand the hospital (including ancillary, mechanical and general plant) to a total of approximately 1,492,000 square feet. For purposes of this estimate, it is assumed to be built between 1st quarter, 2010 and 4th quarter, 2012. Approximately 72,000 total cubic yards of soil would be excavated and removed from the site.

The existing Laurelon Terrace buildings would be demolished, totaling approximately 110,000 square feet. During the demolition of the existing housing units at Laurelon Terrace, there is a potential for lead paint or asbestos to be found due to the age of the buildings. The Puget Sound Clean Air Agency requires, prior to demolition, that an asbestos survey be performed and an abatement plan be developed to prevent the releases into the atmosphere and to protect worker safety.

2.7.5.2 Alternative 8 - Phase 2

Phase 2 construction would include the Diagnostic and Therapeutic, and would expand the hospital (including ancillary, mechanical and general plant) to a total of approximately 1,604,000 square feet. For purposes of this estimate, it is assumed to be built between 4th quarter, 2013 and 4th quarter, 2016. Phase 2 also includes a 1,213 staff garage on the Laurelon Terrace site. The garage would be built between 1st quarter, 2014 and 3rd quarter, 2015. Approximately 150,000 total cubic yards of soil would be excavated and removed from the site for Phase 2. Approximately 65,000 square feet of existing buildings would be demolished.

2.7.5.3 Alternative 8 - Phase 3

Phase 3 construction would include Bed Units 3 and 4, Diagnostic and Therapeutic, and office space above the Laurelon Terrace garage, and would expand the hospital (including ancillary, mechanical and general plant) to a total of approximately 2,210,000 square feet. For purposes of this estimate, it is assumed to be built in two subphases. Subphase 3A would be constructed between 2nd quarter, 2017 and 4th quarter, 2019. Subphase 3B would be constructed between 1st quarter, 2022 and 4th quarter, 2024. Approximately 98,000 total cubic yards of soil would be excavated and removed from the site.

2.7.5.4 Alternative 8 - Phase 4

Phase 4 would include the demolition of the Giraffe Garage, and the construction of the North Garage in two phases and offices, and would expand the hospital (including ancillary, mechanical and general plant) to a total of approximately 2,357,000 square feet. For purposes of this estimate, it is assumed to be built between 2nd quarter, 2025 and 4th quarter, 2027. Approximately 172,000 total cubic yards of soil would be excavated and removed from the site.

Table 2-1d summarizes the construction activities of each phase for Alternative 8.

Table 2-1d
Summary of Construction Activities of Each Phase for Alternative 8

	Alternative 8			
	Phase 1 Including ED	Phase 2	Phase 3A and 3B	Phase 4
	1st Qtr 2010 – 4th Qtr 2012	4th Qtr 2013 – 4th Qtr 2016	2nd Qtr 2017 – 4th Qtr 2019 1st Qtr 2022 - 4th Qtr 2024	2nd Qtr 2025 – 4th Qtr 2027
Square Footage Added	592,000	177,000 (no Hartmann)	742,000 (two construction phases)	147,000
Demolition (sf)	Laurelon Terrace (approximately 110,000)	65,000 (D Wing 47,000 F Wing 18,000)	136,000 (Train)	169,000 (Giraffe Garage)
Parking Added (spaces)	300 surface stalls on Laurelon Site	1,213 Laurelon Garage	0	1,279 North Garage Expansion
Soil excavation and removal (cu yds)	72,000	150,000	98,000	172,000

2.8 Alternatives Considered But Not Advanced

2.8.1 Alternatives Included In Initial Concept Plan (July 2007)

In its July 2007 Concept Plan, Children's proposed two alternatives for further development of the campus, one including the Hartmann property and one without. The July 2007 alternatives are summarized in Table 2-2.

2.8.2 Alternatives Included In Preliminary Draft Master Plan (January 2008)

In response to comments received from the public and the Department of Neighborhoods on the July 2007 Concept Plan, the Seattle Department of Planning and Development (DPD) requested in its September 24, 2007 Scoping Report that Children's propose one or more additional alternatives. Seattle DPD asked that these additional alternatives be alternatives that could feasibly attain or approximate their stated objective in a different development plan(s) and a lower overall height than proposed in the concept plan. In response, Children's presented three new alternatives, shown below in Table 2-3 as Alternatives 3, 4 and 5.

Table 2-2
Alternatives Proposed in July 2007 Concept Plan

	Existing	Proposed – Campus and Hartmann	Alternative – Campus Only
Institution Boundary	Existing 21.7-acre site	Existing 21.7-acre site and 1.78-acre Hartmann site (redeveloped)	Existing 21.7-acre site
Total Building Area Within MIO	900,000 gsf campus	2.23 million gsf hospital campus 170,000 gsf Hartmann	2.4 million gsf hospital campus 16,228 gsf Hartmann
Leased Space Outside MIO Within 2500'	Springbrook 4,000 gsf	Pursuant to SMC 23.69.022	Pursuant to SMC 23.69.022
Owned Space Outside MIO Within 2500'	Hartmann 16,228 gsf	Hartmann 0 gsf (Incorporated into Institutional Boundary)	Hartmann 0 gsf (Incorporated into Institutional Boundary)
Uses	250-bed hospital, clinic, research, office, and clinical laboratory; clinic and office at Hartmann	500–600 bed hospital, clinic, research, clinical laboratory, office on campus; clinic and office at Hartmann	500–600 bed hospital, clinic, research, clinical laboratory, office on campus; clinic and office at Hartmann
Street Vacations	None	None	None
Parking	2,167 total stalls 1,462 on campus 80 at Hartmann 625 leased off-campus	4,200 total stalls 3,000 on campus 530 at Hartmann 670 leased off-campus	4,280 total stalls 3,000 on campus 80 at Hartmann 1,200 leased off-campus
Parking Location	Whale and Giraffe garages; surface lots; off-campus leased parking	Whale Garage; new garage on NE campus to replace Giraffe Garage; new underground parking at Hartmann; off-campus leased parking	Whale Garage; new garage on NE campus to replace Giraffe Garage; existing surface parking at Hartmann; off-campus leased parking
Access	1 primary access: Sand Point Way NE	3 access points: Sand Point Way NE (existing) NE 50th Street NE 45th Street	3 access points: Sand Point Way NE (existing) NE 50th Street NE 45th Street
Height Limit for MIO	37', 50', 70' and 90'	50' and 240' on campus 50' and 120' at Hartmann	50' and 240' on campus 40' at Hartmann

gsf – gross square feet

Table 2-3
Alternatives Proposed in January 2008 Preliminary Draft Master Plan

	Alternative 1 – No Build	Alternative 2 – Initial Concept	Alternative 3 – Proposed	Alternative 4 – Expanded Boundary	Alternative 5 – North Campus Expansion
Institution Boundary	Existing 21.7-acre site	Exiting 21.7-acre site and 1.78-acre Hartmann site (redeveloped)	Existing 21.7-acre site and 1.78-acre Hartmann site (redeveloped)	Existing 21.7-acre site, 1.78-acre Hartmann site (redeveloped) and 6.75-acre Laurelon Terrace site (redeveloped)	Existing 21.7-acre site and 1.78-acre Hartmann site (redeveloped)
Total building area within MIO	900,000 gsf campus	~2.23 million gsf hospital campus; 170,000 gsf Hartmann	~2.23 million gsf hospital campus; 170,000 gsf Hartmann	~2.23 million gsf hospital campus and Laurelon Terrace; 170,000 gsf Hartmann	~2.23 million gsf hospital campus; 170,000 gsf Hartmann
Leased space outside MIO within 2,500 feet	Springbrook 4,000 gsf	Pursuant to SMC 23.69.022	Pursuant to SMC 23.69.022	Pursuant to SMC 23.69.022	Pursuant to SMC 23.69.022
Owned space outside MIO within 2,500 feet	Hartmann 16,228 gsf	Hartmann 0 gsf (Incorporated into Institutional Boundary)	Hartmann 0 gsf (Incorporated into Institutional Boundary)	Hartmann 0 gsf (Incorporated into Institutional Boundary)	Hartmann 0 gsf (Incorporated into Institutional Boundary)
Uses	250 bed hospital, clinic, research, office, and clinical laboratory; clinic and office at Hartmann	500–600 bed hospital, clinic, research, clinical laboratory, office on campus; clinic and office at Hartmann	500–600 bed hospital, clinic, research, clinical laboratory, office on campus; clinic and office at Hartmann	500–600 bed hospital, clinic, research, clinical laboratory, office on campus; clinic and office at Hartmann	500–600 bed hospital, clinic, research, clinical laboratory, office on campus; clinic and office at Hartmann
Street vacations	None	None	None	NE 41st St	None
Parking	~2,167 total stalls: 1,462 on hospital campus 80 at Hartmann 625 off-campus	~4,200 total stalls: 3,000 on hospital campus 530 at Hartmann 670 off-campus	~4,200 total stalls: 3,000 on hospital campus 530 at Hartmann 670 off-campus	~4,200 total stalls: 2,600 on hospital campus 400 at Laurelon Terrace 530 at Hartmann 670 off-campus	~4,200 total stalls: 3,000 on hospital campus 530 at Hartmann 670 off-campus

Table 2-3
Alternatives Proposed in January 2008 Preliminary Draft Master Plan (continued)

	Alternative 1 – No Build	Alternative 2 – Initial Concept	Alternative 3 – Proposed	Alternative 4 – Expanded Boundary	Alternative 5 – North Campus Expansion
Parking location	Whale and Giraffe Garages; surface lots; off-campus leased parking	Whale Garage; new garage on north portion of the campus to replace existing Giraffe Garage; new underground parking at Hartmann; off-campus leased parking	Whale Garage; new garage on north portion of the campus to replace existing Giraffe Garage; new underground parking at Hartmann; off-campus leased parking	Whale Garage; new garage on north portion of the campus to replace existing Giraffe Garage; new above-ground structured parking at Laurelon Terrace, new underground parking at Hartmann; off-campus leased parking	Whale Garage; new garage on north portion of the campus to replace existing Giraffe Garage; new underground parking at Hartmann; off-campus leased parking
Access	1 primary access: Sand Point Way NE (existing): full movements	3 access points: Sand Point Way NE (existing): full movements NE 50th Street: right in, left out NE 45th Street: left in, right out	3 access points: Sand Point Way NE (existing): full movements NE 50th Street: right in, left out NE 45th Street: left in, right out	3 access points: and Point Way NE (existing): full movements NE 50th Street: right in, left out NE 45th Street: left in, right out 40th Avenue NE: full movements	3 access points: and Point Way NE (existing): full movements NE 50th Street: right in, left out NE 45th Street: left in, right out
Height limit for MIO	MIO of 37', 50', 70', and 90'	South of Penny Drive: MIO of 50' and 90' on the east, MIO of 240' on the west; North of Penny Drive: MIO of 50'; Hartmann site developed at MIO 50' to 105'	South of Penny Drive: MIO of 37', 50', 70', 90' and 105' on the east, MIO of 37', 50', 90', 105' and 160' on the west; North of Penny Drive: MIO of 50'; Hartmann site developed at MIO 50' to 105'	South of Penny Drive: MIO of 37', 50', 70', 90' and 105' on the east, MIO of 90' and 160' on the west; North of Penny Drive: MIO of 50' and 90': Hartmann site developed at MIO 50' to 105'; Laurelon Terrace site developed at MIO of 37', 50', 90' and 160'	South of Penny Drive: MIO of 37', 50', 70', 90', and 105' on the east, MIO of 37', 50', 90', 105' and 160' on the west; North of Penny Drive: MIO of 37', 50' and 90'; Hartmann site developed at MIO 50' to 105'

gsf – gross square feet
SMC – Seattle Municipal Code

2.8.3 Alternatives No Longer Under Consideration

In January 2008, Children's submitted its Preliminary Draft Master Plan. The alternatives presented in the January 2008 Preliminary Draft Master Plan are summarized above in Table 2-3. A number of comments were received from the City Departments, the Citizens Advisory Committee (CAC) and the public on the alternatives and their design features. In response,

Children's has considered the following alternatives and has eliminated them from further study for the reasons identified below.

- **Alternative 2 – Initial Concept:** This alternative proposed the total development of 2.23 million square feet on campus at heights up to 240 feet south of Penny Drive and up to 50 feet north of Penny Drive, plus 170,000 square feet of development on Hartmann site at heights up to 105 feet (reduced from original concept of 150 feet). This alternative was eliminated at the request of both the City's Department of Planning and Development and the Citizen's Advisory Committee.
- **Alternative 4 – Expanded Boundary, Late Laurelon Development:** This alternative proposed the development of 2.23 million square feet on campus at heights up to 160 feet south of Penny Drive and up to 90 feet north of Penny Drive, up to 160 feet on Laurelon Terrace site, plus 170,000 square feet of development on the Hartmann site at heights up to 105 feet. This alternative was eliminated by Children's and replaced by new Alternative 7 showing an alternative based on an earlier acquisition of the Laurelon Terrace property. (Alternative 7 has been revised and is now included as Alternative 7R. Both Alternative 7R and new Alternative 8 assume an early acquisition of the Laurelon terrace property.)
- **Alternative 5 – North Campus Expansion:** This alternative proposed the development of 2.23 million square feet on campus at heights up to 160 feet south of Penny Drive and up to 90 feet north of Penny Drive, plus 170,000 square feet of development on Hartmann site at heights up to 105 feet. This alternative was eliminated by Children's as the design features are very similar to new Alternative 6 – Modified North Campus Expansion.
- **CAC Campus Expansion Alternative:** In January 2008 the CAC formed a subcommittee to develop design guidelines for a Citizen's Advisory Committee-proposed alternative. The design guidelines would have allowed the development of up to 1.9 million square feet on campus at heights up to 128 feet south of Penny Drive and 90 feet north of Penny Drive. While not included in the MIO, the Hartmann site could be rezoned to a Neighborhood Commercial zone (NC3) at a height of 50 feet, allowing up to 135,000 square feet on the Hartmann site. This alternative was determined not to meet Children's stated project objectives of being able to add up to 350 beds over the next 15 to 20 years. Children's has incorporated design guidelines proposed by the Citizen's Advisory Committee and developed a new Alternative 6 – Modified North Campus Expansion.
- **Site Access:** Children's is no longer proposing that general site access be provided on 45th Street NE for any of the Build Alternatives, and is no longer proposing that general site access be provided on 50th Street NE for Alternative 7, nor is general site access from 50th Street NE proposed for Alternatives 7R or 8. Alternatives 3 and 6 include a new shuttle only access point on 45th Street NE to facilitate and improve transit access on the campus and to the neighborhood.

2.9 Benefits and Disadvantages of Delaying Project Implementation

The benefits of deferring action on the proposal would include:

- Delaying construction impacts (the primary benefit); however, the phased nature of this development proposal will postpone some of the construction impacts until later phases of the development.
- Allowing more certainty regarding potential improvements to surrounding roadways (SR 520) and transit (Sound Transit Link light rail and additional Metro routes).

The disadvantage of deferring action on the proposal would be precluding the addition of new hospital beds at the existing site:

- According to Children's, they are already experiencing the effects of local and regional population growth. Children's last Certificate of Need (which determines number of inpatient beds) was issued in 2001. Since that time, patient volumes have increased and levels of care have intensified. These effects include:
    - As a national standard of care, the recommended average inpatient occupancy level is 65 percent, because pediatric illness is unpredictable (patients with chronic, life-long diseases are more likely to have unplanned admissions) and patients must be admitted to units appropriate to their age and acuity level. Children's already is consistently operating at an average occupancy of 75 percent.
    - The advances in medical technology and specific expertise available at Children's have also contributed to the higher occupancy levels. Children with medical problems that could not previously be addressed in the Northwest can now receive care at Children's.
    - According to Children's, the Melinda French Gates Ambulatory Care Building (opened in 2006) is already at capacity. Outpatient visits have grown 14 percent over the last two years. More outpatient visits lead to increased inpatient admissions, as some of the patients treated in the ambulatory clinics require hospitalization.
- When inpatient bed occupancy reaches an average of 75 percent or more, there are many days when elective admissions must be cancelled or rescheduled at Children's. Often major surgery cases, such as open heart surgery, scheduled to correct a congenital defect of the heart, require the family to organize their life around this major event and rescheduling is very challenging.
- Further challenges occur when an appropriate pediatric bed is not available at Children's, requiring a child to be transported to other institutions—sometimes out of state via medical air transportation.

Section 3 - Environmental Analysis

3.1 Geology

3.1.1 Affected Environment

3.1.1.1 Geology

The general geology of the area within and adjacent to Children's consists of deep deposits (almost 700 feet) of glacial and interglacial clays, silts, sands, and gravels of the Pleistocene Epoch (1.6 million to 10,000 years ago). During the most recent period of glacial advance (the Vashon period, ending 13,600 years ago), these soils were covered by as much as 3,000 feet of ice. The fine-grained silts and clays are typically very stiff to hard with localized zones of fracturing and slickensides[1], indicative of localized shearing. The granular soils are typically dense to very dense. Underneath is very deep bedrock, consisting of volcanic or sedimentary formations.

3.1.1.2 Soils

Extensive subsurface explorations have been conducted at Children's to identify the near-surface soil conditions. Recently, a deep water well was drilled at Children's to a depth exceeding 700 feet and soil conditions were observed. The soils tests show that there is a thin yet variable layer of fill soils placed during localized site grading. The fill soils overlay a very deep deposit of glacially consolidated lacustrine silt and clays.

Continuous groundwater has not been found in any of the explorations at Children's. Zones of "perched water" were found at varying elevations. The source of this water is surface water that has infiltrated the area and tends to flow along zones of higher permeability soils within the mass of the silts and clays. This water is discontinuous and limited in extent.

No recent soil studies have been done at either the Hartmann site or the Laurelon Terrace site. If the City approves the use of these sites by Children's, a soils report prepared by a qualified geotechnical engineer or geologist licensed by the State of Washington will be prepared to identify recommended foundation and construction methods.

3.1.2 Impacts

3.1.2.1 Geology

Construction would have no impact on geology. Construction of below-grade structures would require drainage of structures within the depth of the excavation to intercept subsurface perched water and discharge it to the stormwater system.

---

[1] Slickensides are polished striated rock surfaces caused by one rock mass moving across another on a fault.

3.1.2.2 Soils

Excavations for below-grade foundations would be part of the construction of major structures. The excavations are anticipated to be more than one story deep. Given the confined nature of the site, excavations would require the use of structural shoring systems in the form of either soil nail systems or conventional soldier piles with tieback anchors.

The estimated soil to be excavated for the proposed construction is shown in Table 3.1-1. Approximately 54,000 square feet of development remains to be constructed under the existing Major Institution Master Plan. For the purposes of this EIS, this could occur under Alternative 1 – No Build. Minimal to no soil excavation is expected to be needed if the 54,000 additional square feet is constructed. See Section 2.7 of Chapter 2 for a description and timing of the construction phases.

Table 3.1-1
Estimated Volume of Excavated Soil
Total Cubic Yards (tcy)

Construction Phase	**Alternative 3 – ~~Proposed~~South Campus Expansion**	**Alternative 6 – Modified North Campus Expansion**	**Alternative 7R – Expanded Boundary, Early Laurelon Development**	**Alternative 8 - Early Laurelon Development without Hartmann**
~~Addition of 24 beds on Train Building~~				
Phase 1 –				
Bed Unit	65,000	65,000	~~95,000~~72,000	72,000
Garage	70,000	126,000	~~45,000~~Not applicable	Not applicable
Phase 2 –				
Bed Unit	119,000	119,000	~~34,000~~Not applicable	Not applicable
Garage	51,000	84,000	~~36,000~~Not applicable	Not applicable
Hartmann	93,000	~~53,000~~43,000	43,000	Not applicable
D&T, Loading Dock	Not applicable	Not applicable	39,000	39,000
Garage at Laurelon	Not applicable	Not applicable	74,000	111,000
Phase 3 –				
Bed Unit and D&T ~~Diagnostics and Therapy~~	16,000	75,000	~~55,000~~98,000	98,000
Garage(s)	Not applicable	Not applicable	~~74,000~~ Not applicable	Not applicable
Phase 4 –				
Bed Unit and D&T ~~Diagnostics and Therapy~~	21,000	17,000	Not applicable	Not applicable
Garage	Not applicable	136,000	~~Not applicable~~ 172,000	172,000

"D&T" as used in Table 3.1-1 stands for Diagnostics and Therapeutic

To complete the excavations, soil would be brought to the surface, loaded into trucks and transported for off-site disposal. During this process, soil could be tracked on the surrounding streets or sidewalks, or washed into the stormwater system. This would be prevented by using City of Seattle-approved Temporary Erosion and Sediment Control Plans, which specifically address and mitigate these potential issues.

The west side of the Hartmann property is adjacent to the Burke-Gilman Trail. The trail is at a higher elevation and is separated from the Hartmann property by a steep slope. Due to its steepness, a portion of this slope is designated as an Environmentally Critical Area by the Seattle Department of Planning and Development. The construction of a new building at the Hartmann site would require vertical cuts along the property line at the base of this steep slope to accommodate below-grade structures and parking. Depending on the design and location of the proposed building and foundations, an exemption from the requirements of SMC 25.09 may need to be obtained. Unless the appropriate precautions are employed, these soils are potentially susceptible to land slides. Structural shoring systems would be used to stabilize both the excavation and the steep slope above the top of the excavation.

The excavation would include first drilling deep holes for soldier piles and tieback anchors and exposing a vertical face of soil, which will then be supported through the placement of horizontal timbers (lagging). During excavation, perched groundwater deposits may be encountered, which could drain into the excavation. These activities create the possibility of lateral and vertical displacement of the ground surrounding the site, including pavements, streets, utilities, and foundations of existing structures. These impacts would be prevented by monitoring conditions using surveying and other instruments to measure vertical and lateral displacements, as well as the occurrence and growth of cracks in existing pavements and walls. The amount of soil withdrawn from drilled holes would be estimated to assess the possible occurrence of caving that would induce ground settlements.

3.1.3 Mitigation Measures

3.1.3.1 Construction

- Prior to any construction activities along the slope on the Hartmann site, a soils report prepared by a qualified geotechnical engineer or geologist licensed by the State of Washington will be prepared and submitted to the City to demonstrate that it is safe to construct in that area without causing land slides .
- All construction on the Hartmann site would comply with the requirements of SMC 25.09 Regulations for Environmentally Critical Areas.
- All excavation, drilling, shoring, and foundation support would be performed in accordance with recommendations from the geotechnical and structural engineers based on site-specific exploration of subsurface soil and groundwater conditions. The design of foundations and floor slabs would consider all appropriate loading conditions and the influence of the new foundations on early structures.
- The foundation and building superstructure would be designed in accordance with appropriate seismic requirements contained in the Seattle Building Code, incorporating soil parameters that govern ground motion and forces imparted to the structure. Permanent subsurface walls would be designed to accommodate earth pressure resulting from seismic shaking.
- Shoring would be designed and installed using standard soldier-pile and tieback methods that are commonly used in Seattle.

- A monitoring program would be implemented using surveying and other instruments to measure vertical and lateral displacements as well as the occurrence and growth of cracks in existing pavements and walls. The amount of soil withdrawn from drilled holes would be estimated to assess the possible occurrence of caving that would induce ground settlements. The use of steel casings or drilling mud would be adopted where necessary to prevent loss of ground around the holes and accompanying settlements and subsidence.
- Any subsurface utilities that are at risk of damage due to settlements or lateral displacement would be re-routed or provided with additional support.
- Water entering the excavation would be drained by installing drainage composite materials on the shoring walls and drainage trenches and piping at the bottom of the excavation, in addition to pumping from excavated sumps. Drilled wells may be used to control water where required.
- Surface water would be prevented from entering the site to the extent possible.
- To minimize the possibility of tracking soil from the site, the wheels and undercarriage of trucks and other vehicles leaving the site would be washed and the sediment-laden wash water would be controlled using erosion control methods prescribed as City of Seattle and King County best management practices for construction projects. Such practices include the use of sediment traps, check dams, stabilized entrances to the construction site, erosion control fabric fences and barriers, and other strategies to control and contain sediment.
- The soils loaded into the trucks would be covered with tarps or other materials to prevent spillage onto the streets and transport by wind.
- Tarps would be used to cover temporary on-site storage piles.

3.1.3.2 Operation

No mitigation measures are required.

3.1.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts would be expected.

3.1.5 Secondary and Cumulative Impacts

No secondary or cumulative impacts would be expected.

3.2 Air

3.2.1 Affected Environment

Typical sources of air pollution within the Children's project area include vehicular traffic, a variety of commercial enterprises, and residential wood-burning fireplaces and stoves. The major concern with regard to air pollution from vehicular traffic is carbon monoxide (CO). CO is the pollutant that is emitted in the largest quantity for which ambient air standards exist.

Other pollutants generated by traffic include the ozone precursors: hydrocarbons and nitrogen oxides. In addition, sulfur oxides and nitrogen dioxide are emitted by motor vehicles, although concentrations of these pollutants are usually low, except for near large industrial facilities.

The Children's project study area is in an ozone air quality "maintenance" area. This is a nonattainment area that has been found to be in attainment of the standard, but which is still subject to special air quality reviews until the standard has been maintained for at least 10 years. However, recently, ambient ozone levels were measured to exceed the current standard, and this may result in the area being redesignated "nonattainment" after data are certified. Under current air quality plans and policies, ~~this status has~~there are no direct implications for ~~and~~ any of the alternatives.

Federal, state, and local regulations set limits on the concentrations of particles less than or equal to about 10 micrometers in diameter. This fraction of particulate matter, called PM_{10}, is important in terms of potential human health impacts, because particles this size can be inhaled deeply into human lungs. PM_{10} is generated by fuel combustion sources (e.g., residential wood burning, motor vehicle engines, etc.), industrial activities and operations, and other sources. Such sources occasionally cause high PM_{10} levels in the Puget Sound region, and three areas in Seattle, Tacoma, and Kent have been declared nonattainment areas because PM_{10} concentrations sometimes exceed health standards. Particles less than or equal to about 2.5 micrometers in diameter are designated as $PM_{2.5}$. Fine particulate matter (which includes both PM_{10} and $PM_{2.5}$) also is emitted in vehicle exhaust and generated by tire action on pavement (or unpaved areas). However, the amount of PM_{10} and $PM_{2.5}$ generated by individual vehicles is small compared with other sources (e.g., wood-burning fireplaces, stoves). There are no PM_{10} monitors in the immediate project area. The project area is not in a non-attainment or maintenance area for PM_{10}.

Children's campus is located in what was previously designated in 1991 as a CO nonattainment area that encompasses a large portion of the Everett-Seattle-Tacoma urban area. This designation required the Puget Sound Clear Air Agency (PSCAA) and the Washington State Department of Ecology to develop strategies and plans to work toward complying with the ambient standards, and affected transportation planning and emission control policies throughout the nonattainment area. In 1997, the US Environmental Protection Agency (EPA) re-designated the Central Puget Sound region as attainment for CO, and approved the associated maintenance plan to ensure the area remains attainment for the CO National Ambient Air Quality Standards. The Children's site is located in a CO maintenance area.

The air quality of the area at present is likely to be typical of the urbanized areas of the Puget Sound. It is expected that typical conditions of two to three parts per million of CO are present in the area, but that under atypical circumstances, concentrations may rise to two to three times that level. The National, State and PSCAA standard for CO is nine parts per million. Atypical air quality conditions could include cold temperatures and high traffic volumes.

According to the PSCAA, CO levels are well below federal standards and no longer considered a pollutant of concern in the Puget Sound area. This region was designated as "attainment" status in 1996 and has not violated the CO standard since 1990. The Washington State Department of Ecology monitors CO levels.

PSCAA also reports that emission inventories suggest that volatile organic compound (VOC) and nitrogen oxide (NOx) emissions will continue to decrease, despite increasing population and vehicle use. This reduction is mainly due to tighter federal VOC and NOx controls for on-road and non-road mobile sources.

There are both stationary sources and vehicles that contribute air emissions from operations at Children's. Each of these categories is discussed below.

3.2.1.1 Stationary Sources

Currently Children's has four natural-gas fired boilers, each rated at 14,500 million Btu/hr (MBH). These contribute emissions of NOx and CO, and much smaller quantities of VOCs, condensable particulate matter (PM_{10}) and filterable particulate matter ($PM_{2.5}$). The emissions from these boilers are the largest stationary sources of air pollutants. Measurements of NOx and CO pollutant concentrations from the boilers were made in 2003. Assuming that all of the boilers operate continuously, emission estimates can be made from these concentration data. One of the boilers had extremely high CO concentrations, and the source of these data indicated that some upgrades to the boilers has been made that has resulted in some improvement. However, without more recent data, we have assumed emissions associated with the measurements made. No measurements have been made of VOCs, PM_{10} or $PM_{2.5}$, so estimates of these pollutants emissions are based on EPA document AP-42 (EPA 2007). The maximum or "worst-case" annual emissions are shown in Table 3.2-1.

Table 3.2-1
Maximum Annual Boiler Emissions

Pollutant	Estimated Maximum Boiler Emissions (tons/yr)
Nitrogen Oxides	5
Carbon Monoxide	146
Condensable Particulate Matter (PM_{10})	1.5
Filterable Particulate Matter ($PM_{2.5}$)	0.5
Volatile Organic Compounds	1.4

Assumes 8,760 hours/year operation for all boilers

There are insignificant emissions of VOC from laboratory vent exhausts, and possible leaks of hydrofluorocarbons from electric chillers with a 3,080-ton capacity.

3.2.1.2 Vehicles

Children's presently generates about 9,200 vehicle trips daily, with about 800 trips during the AM peak hour and 720 trips during the PM peak hour. Estimated daily emissions are shown in Table 3.2-2.

Table 3.2-2
Vehicle Emissions from Children's Daily Vehicle Trips

Pollutant	Estimated Daily Emissions (lbs/day)
Nitrogen Oxides	130
Carbon Monoxide	1169
Condensable Particulate Matter (PM_{10})	152
Filterable Particulate Matter ($PM_{2.5}$)	30
Volatile Organic Compounds	97

Based on California emissions method (URBEMIS 2007 model)

Trips generated by Children's staff, patients, and visitors represent approximately 25 to 35 percent of the peak hour trips, and would therefore represent approximately the same percentage of estimated daily emissions along Sand Point Way NE adjacent to the hospital.

3.2.1.3 Greenhouse Gas Emissions

The principal greenhouse gases are carbon dioxide, NOx, methane, and three groups of high-warming potential gases—hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Washington's Department of Community, Trade & Economic Development has estimated that the state's greenhouse gas emissions totaled 80.3 million tons in 2004. Approximately half those emissions are attributed to the transportation sector, and 14 percent of those emissions are attributed to electric power generation.

In response to concerns about global warming, DPD has adopted King County's Greenhouse Gas (GHG) emissions worksheet to provide an estimate of potential GHG emissions from development projects. That potential is expressed as equivalent CO2 emissions, or $MTCO_2e$ (Metric Tons of equivalent carbon dioxide). Using the worksheet, total emissions are estimated at 1,419,823 $MTCO_2e$ for the No ~~Action~~ Build Alternative. These figures represents an estimate of GHG emissions created over the lifespan of the project, including those associated with manufacturing construction materials, fuel used during construction, energy consumed during facility operation, and transportation by employees. The GHG worksheet uses a standard project lifespan of 62.5 years. GHG emission worksheets for both the existing campus and expanded campus are included in Appendix A.

3.2.2 Impacts

3.2.2.1 Construction

Four Build ~~a~~Alternatives ~~are being considered~~were evaluated for construction, plus the potential construction of 54,000 square feet remaining in the existing MIMP under Alternative 1**.** Estimates for air quality impacts are based on potential scenarios of how the hospital could be phased for any of the build alternatives. The exact square footages and timing of each phase of each alternative are currently uncertain.

Alternative 1

Alternative 1 would ~~include a new floor with approximately 20 to 22 inpatient beds added to the top of the Train building. The hospital area would increase from 829,000 sf to 849,000 sf. The construction period is estimated to be between October 2008 and November 2009. No demolition or excavation is anticipated as part of this alternative~~include 54,000 square feet of new development; the amount of undeveloped space remaining in the existing MIMP.

Alternative 3

Alternative 3 - Phase 1
Phase 1 construction at Children's would include a new Emergency Department, Bed Unit 1 and Diagnostic and ~~Treatment~~Therapeutic. Phase 1 would ~~increase~~ expand the hospital (including ancillary, mechanical and general plant) to a total of around 1,458,000 square feet. For purposes of this estimate, it ~~was~~ is assumed to be built between ~~3rd~~1st quarter, ~~2009~~ 2010 and ~~1st~~ 4th quarter, ~~2011~~2012. Phase 1 includes a garage that would increase parking to 2,530 spaces and would be built between 3rd quarter, 2010 and 2nd quarter 2012. Approximately 135,000 ~~truck~~ total cubic yards of soil would be excavated and removed from the site.

Alternative 3 - Phase 2
Phase 2 construction would include the Hartmann Building, Bed Unit 2 and Diagnostic and ~~Treatment~~Therapeutic, and would ~~increase~~expand the hospital (including ancillary, mechanical and general plant) to a total of around 1,838,000 square feet. For purposes of this estimate, it ~~was~~ is assumed to be built between ~~3rd~~ 1st quarter, ~~2011~~ 2012 and ~~1st~~ 2nd quarter, 2015. Phase 2 also includes a garage but because of land taken for the buildings, parking would decrease to 2,430 spaces. The garage would be built between 4th quarter, 2011 and 2nd quarter, 2013. Approximately ~~296,000~~263,000 ~~truck~~total cubic yards of soil would be excavated and removed from the site for Phase 2.

Alternative 3 - Phase 3
Phase 3 construction would include Bed Unit 3 and Diagnostic and ~~Treatment~~Therapeutic, and would ~~increase~~expand the hospital (including ancillary, mechanical and general plant) to a total of around 2,046,000 square feet. For purposes of this estimate, it ~~was~~ is assumed to be built between 1st quarter, 2016 and ~~1st~~ 4th quarter, ~~2019~~2018. Phase 3 also includes a garage that would increase parking to 3,530 spaces. Approximately 16,000 ~~truck~~total cubic yards of soil would be excavated and removed from the site.

Alternative 3 - Phase 4

Phase 4 would include Bed Unit 4 and Diagnostic and ~~Treatment~~Therapeutic, and would ~~increase~~expand the hospital (including ancillary, mechanical and general plant) to a total of 2,393,000 square feet. For purposes of this estimate, it ~~was~~ is assumed to be built between 2nd quarter, 2020 and ~~1st~~ 4th quarter, ~~2023~~2022. Phase 4 would not include a garage so parking would remain at 3,530 spaces. Approximately 21,000 ~~truck~~total cubic yards of soil would be excavated and removed from the site.

Table 3.2-3 summarizes the construction activities of each phase for Alternative 3.

Table 3.2-3
Summary of Construction Activities of Each Phase of Alternative 3

	Alternative 3			
	Phase 1 includes ED	**Phase 2**	**Phase 3**	**Phase 4**
	1st Qtr 2010 – 4th Qtr 2012	**1st Qtr 2012 – 2nd Qtr 2015**	**1st Qtr 2016 – 4th Qtr 2018**	**2nd Qtr 2020 – 4th Qtr 2022**
Square Footage Added	~~515,300~~623,000	~~379,700~~499,000	~~208,600~~208,000	~~347,300~~347,000
Parking Added (spaces)	1,139	-100	1,100	0
Soil excavation and removal (cu yds)	135,000	~~296,000~~263,000	16,000	21,000
Demolition (sf)	65,000	119,000	0	0

Alternative 6

Alternative 6 - Phase 1

Phase 1 construction at Children's would include a new Emergency Department, Bed Unit 1 and Diagnostic and ~~Treatment~~Therapeutic. Phase 1 would ~~increase~~expand the hospital (including ancillary, mechanical and general plant) to a total of around 1,225,000 square feet. For purposes of this estimate, it ~~was~~ is assumed to be built between ~~2nd~~ 1st quarter, 2010 and 4th quarter, 2012. Phase 1 includes a 780 stall garage that would be built between 3rd quarter, 2010 and 2nd quarter 2012. Approximately 191,000 ~~truck~~total cubic yards of soil would be excavated and removed from the site. Approximately 65,000 square feet of existing buildings would be demolished.

Alternative 6 - Phase 2

Phase 2 construction would include the Hartmann Building, Bed Unit 2 and Diagnostic and ~~Treatment~~Therapeutic, and would ~~increase~~expand the hospital (including ancillary, mechanical and general plant) to a total of around 1,712,000 square feet. For purposes of this estimate, it ~~was~~ is assumed to be built between 1st quarter, 2012 and ~~3rd~~ 2nd quarter, 2015. Phase 2 also includes a 255 stall garage. The garage would be built between 2nd quarter, 2012 and 2nd quarter, 2013. Approximately 246,000 ~~truck~~total cubic yards of soil would be excavated and removed from the site for Phase 2. Approximately 119,000 square feet of existing buildings would be demolished.

Alternative 6 - Phase 3

Phase 3 construction would include Bed Unit 3 and Diagnostic and ~~Treatment~~Therapeutic, and would ~~increase~~expand the hospital (including ancillary, mechanical and general plant) to a total of around 1,932,000 square feet. For purposes of this estimate, it ~~was~~ is assumed to be built between 2nd quarter, 2016 and ~~2nd~~ 1st quarter, 2019. Approximately 75,000 ~~truck~~total cubic yards of soil would be excavated and removed from the site.

Alternative 6 - Phase 4

Phase 4 would include Bed Unit 4 and Diagnostic and ~~Treatment~~Therapeutic, and would ~~increase~~expand the hospital (including ancillary, mechanical and general plant) to a total of 2,425,000 square feet. For purposes of this estimate, it ~~was~~ is assumed to be built between 2nd quarter, 2020 and 4th quarter, 2022. A parking garage with 807 stalls would be included. Approximately 153,000 ~~truck~~total cubic yards of soil would be excavated and removed from the site.

Table 3.2-4 summarizes the construction activities of each phase for Alternative 6.

Table 3.2-4
Summary of Construction Activities of Each Phase of Alternative 6

	Alternative 6			
	Phase 1 including ED	**Phase 2**	**Phase 3**	**Phase 4**
	1st Qtr 2010 – 4th Qtr 2012	**1st Qtr 2012 – 2nd Qtr 2015**	**2nd Qtr 2016 – 1st Qtr 2019**	**2nd Qtr 2020 – 4th Qtr 2022**
Square Footage Added	~~396,000~~390,000	~~487,000~~606,000	220,000	493,000
Parking Added (spaces)	780	255	0	807
Soil excavation and removal (cu yds)	191,000	246,000	75,000	153,000
Demolition (sf)	65,000	119,000	0	168,000

Alternative 7R

Alternative 7R - Phase 1

Phase 1 construction at Children's would include a new Emergency Department, Bed Units 1 and 2 and Diagnostic and ~~Treatment~~Therapeutic. Phase 1 would ~~increase~~expand the hospital (including ancillary, mechanical and general plant) to a total of around ~~1,335,000~~1,492,000 square feet. For purposes of this estimate, it ~~was~~ is assumed to be built between 1st quarter, 2010 and ~~3rd~~ 4th quarter, 2012. ~~Phase 1 includes a 700 stall garage that would be built between 3rd quarter, 2010 and 2nd quarter 2012.~~ Approximately ~~140,000~~72,000 ~~truck~~total cubic yards of soil would be excavated and removed from the site.

~~Approximately 100,000 square feet of~~The existing Laurelon Terrace buildings would be demolished, totaling approximately 110,000 square feet. During the demolition of the existing

housing units at Laurelon Terrace, there is a potential for lead paint or asbestos to be found due to the age of the buildings. The ~~City of Seattle~~Puget Sound Clean Air Agency requires that, ~~as part of obtaining a~~prior to demolition~~ permit~~, ~~that~~ an ~~lead and~~ asbestos survey be performed and an abatement plan be developed to prevent the releases into the atmosphere and to protect worker safety.

Alternative 7R - Phase 2

Phase 2 construction would include the Hartmann Building~~, Bed Unit 2~~ and Diagnostic and ~~Treatment~~Therapeutic, and would ~~increase~~expand the hospital (including ancillary, mechanical and general plant) to a total of around ~~1,911,000~~1,754,000 square feet. For purposes of this estimate, it ~~was~~ is assumed to be built between ~~3rd~~ 4th quarter, ~~2012~~ 2013 and ~~1st~~ 4th quarter, ~~2015~~2016. Phase 2 also includes a 255 stall garage on the Hartmann site and a 1,100 stall garage on the Laurelon Terrace site. The garages would be built between ~~4th~~ 1st quarter, ~~2012~~ 2014 and ~~2nd~~ 3rd quarter, ~~2013~~2015. Approximately ~~113,000~~156,000 ~~truck~~total cubic yards of soil would be excavated and removed from the site for Phase 2. Approximately ~~16,000~~65,000 square feet of existing buildings would be demolished.

Alternative 7R - Phase 3

Phase 3 construction would include Bed Unit 3 and 4 and Diagnostic and ~~Treatment~~Therapeutic, and would ~~increase~~expand the hospital (including ancillary, mechanical and general plant) to a total of around ~~2,355,000~~2,210,000 square feet. For purposes of this estimate, it ~~was~~ is assumed to be built in two subphases. Subphase 3A would be constructed between 2nd quarter, 2017 and 4th quarter, 2019. Subphase 3B would be constructed between 1st quarter, 2022 and 4th quarter, 2024.~~between 2nd quarter, 2018 and 2nd quarter, 2022~~. Approximately ~~129,000~~98,000 ~~truck~~total cubic yards of soil would be excavated and removed from the site.~~ The remaining 100,000 square feet of existing Laurelon Terrace buildings would be demolished.~~

Alternative 7R - Phase 4

Phase 4 would include the demolition of the Giraffe Garage, and construction of the North Garage in two phases, and offices, and would expand the hospital (including ancillary, mechanical and general plant) to a total of around 2,357,000 square feet. For purposes of this estimate, it is assumed to be built between 2nd quarter, 2025 and 4th quarter, 2027. Approximately 172,000 total cubic yards of soil would be excavated and removed from the site.

Table 3.2-5 summarizes the construction activities of each phase for Alternative 7R.

Table 3.2-5
Summary of Construction Activities of Each Phase of Alternative 7R

	Alternative 7R			
	Phase 1 Including ED	**Phase 2**	**Phase 3A and 3B**	**Phase 4**
	~~1st~~ 4th Qtr ~~2010~~ 2009 – ~~3rd~~ 4th Qtr 2012	**~~3rd~~ 4th Qtr ~~2012~~ 2013 – ~~3rd~~ 4th Qtr ~~2015~~2016**	**2nd Qtr 2017~~2018 – 2nd~~ 4th Qtr 2019** **1st Qtr 2022 – 4th Qtr ~~2022~~2024**	**2nd Qtr 2025 – 4th Qtr 2027**
Square Footage Added	~~506,000~~592,000	~~576,000~~327,000 (including 150,000 at Hartmann)	~~444,000~~592,000 (two construction phases)	147,000
Parking Added (spaces)	~~700~~300 surface stalls on Laurelon Site	1,100 Laurelon Garage 255 Hartmann	~~235~~0	1,167 North Garage Expansion
Soil excavation and removal (cu yds)	~~140,000~~72,000	~~113,000~~156,000	~~129,000~~98,000	172,000
Demolition (sf)	~~100,000~~Laurelon Terrace (approximately 110,000)	~~16,000~~65,000 (D Wing 47,000 F Wing 18,000)	~~100,000~~136,000 (Train)	169,000 (Giraffe Garage)

Alternative 8

Alternative 8 - Phase 1

Phase 1 construction at Children's would include a new Emergency Department, Bed Units 1 and 2 and Diagnostic and Therapeutic. Phase 1 would expand the hospital (including ancillary, mechanical and general plant) to a total of around 1,492,000 square feet. For purposes of this estimate, it is assumed to be built between 1st quarter, 2010 and 4th quarter, 2012. Approximately 72,000 total cubic yards of soil would be excavated and removed from the site.

The existing Laurelon Terrace buildings would be demolished, totaling approximately 110,000 square feet. During the demolition of the existing housing units at Laurelon Terrace, there is a potential for lead paint or asbestos to be found due to the age of the buildings. The Puget Sound Clean Air Agency requires that, prior to demolition, an asbestos survey be performed and an abatement plan be developed to prevent the releases into the atmosphere and to protect worker safety.

Alternative 8 - Phase 2

Phase 2 construction would include the Diagnostic and Therapeutic, and would expand the hospital (including ancillary, mechanical and general plant) to a total of around 1,604,000 square feet. For purposes of this estimate, it is assumed to be built between 4th quarter, 2013 and 4th quarter, 2016. Phase 2 also includes a 1,213 stall garage on the Laurelon Terrace site. The garage would be built between 1st quarter, 2014 and 3rd quarter, 2015. Approximately 150,000 total cubic yards of soil would be excavated and removed from the site for Phase 2. Approximately 65,000 square feet of existing buildings would be demolished.

Alternative 8 - Phase 3

Phase 3 construction would include Bed Units 3 and 4, Diagnostic and Therapeutic, and office space above the Laurelon Terrace garage, and would expand the hospital (including ancillary, mechanical and general plant) to a total of around 2,210,000 square feet. For purposes of this estimate, it ~~is~~ assumed to be built in two subphases. Subphase 3A would be constructed between 2nd quarter, 2017 and 4th quarter, 2019. Subphase 3B would be constructed between 1st quarter, 2022 and 4th quarter, 2024. Approximately 98,000 total cubic yards of soil would be excavated and removed from the site.

Alternative 8 - Phase 4

Phase 4 would include the demolition of the Giraffe Garage, and the construction of the North Garage in two phases and offices, and would expand the hospital (including ancillary, mechanical and general plant) to a total of around 2,357,000 square feet. For purposes of this estimate, it is assumed to be built between 2nd quarter, 2025 and 4th quarter, 2027. Approximately 172,000 total cubic yards of soil would be excavated and removed from the site.

Table 3.2-5a summarizes the construction activities of each phase for Alternative 8.

Table 3.2-5a
Summary of Construction Activities of Each Phase of Alternative 8

	Alternative 8			
	Phase 1 Including ED	**Phase 2**	**Phase 3A and 3B**	**Phase 4**
	1st Qtr 2010 – 4th Qtr 2012	**4th Qtr 2013 – 4th Qtr 2016**	**2nd Qtr 2017 – 4th Qtr 2019** **1st Qtr 2022 – 4th Qtr 2024**	**2nd Qtr 2025 – 4th Qtr 2027**
Square Footage Added	592,000	177,000 (no Hartmann)	742,000 (two construction phases)	147,000
Parking Added (spaces)	300 surface stalls on Laurelon Site	1,213 Laurelon Garage	0	1,279 North Garage Expansion
Soil excavation and removal (cu yds)	72,000	150,000	98,000	172,000
Demolition (sf)	Laurelon Terrace (approximately 110,000)	65,000 (D Wing 47,000 F Wing 18,000)	136,000 (Train)	169,000 (Giraffe Garage)

Based upon these data, estimates were made of daily construction air emissions for Phase 2 through 4 of all Build Alternatives as compared to the Alternative 1. The estimates were made using the URBEMIS emission estimating model. See Tables 3.2-6 though 3.2-8a.

Table 3.2-6
Estimated Maximum Daily Emissions from Construction of Each Phase of Alternative 3 (lbs/day)

	Phase 1	Phase 2	Phase 3	Phase 4
	1st Qtr 2010 – 4th Qtr 2012	1st Qtr 2012 – 2nd Qtr 2015	1st Qtr 2016 – 4th Qtr 2018	2nd Qtr 2020 – 4th Qtr 2022
Nitrogen Oxides	155.90	238.03	52.92	16.10
Carbon Monoxide	108.79	131.68	59.03	21.65
Condensable Particulate Matter (PM_{10})	44.46	138.75	51.00	80.33
Filterable Particulate Matter ($PM_{2.5}$)	15.04	36.57	12.61	17.25
Volatile Organic Compounds	37.13	128.91	339.11	73.38

Based on URBEMIS 2007 model methods for California

Table 3.2-7
Estimated Maximum Daily Emissions from Construction of Each Phase of Alternative 6 (lbs/day)

	Phase 1	Phase 2	Phase 3	Phase 4
	1st Qtr 2010 – 4th Qtr 2012	1st Qtr 2012 – 2nd Qtr 2015	2nd Qtr 2016 – 1st Qtr 2019	2nd Qtr 2020 – 4th Qtr 2022
Nitrogen Oxides	86.31	146.89	33.02	50.89
Carbon Monoxide	104.34	127.50	32.31	56.13
Condensable Particulate Matter (PM_{10})	96.80	159.42	21.78	116.13
Filterable Particulate Matter ($PM_{2.5}$)	24.34	38.39	5.71	26.05
Volatile Organic Compounds	40.09	83.93	42.85	217.33

Based on URBEMIS 2007 model methods for California

Table 3.2-8
Estimated Maximum Daily Emissions from Construction of Each Phase of Alternative 7R (lbs/day)

	Phase 1	Phase 2	Phases 3A and 3B	Phase 4
	1st Qtr 2010 – ~~3rd~~ 4th Qtr 2012	~~3rd~~ 4th Qtr ~~2012~~ 2013 – ~~3rd~~ 4th Qtr ~~2015~~2016	2nd Qtr 2017 – 4th Qtr 2019 1st Qtr 2022 - 4th Qtr 2024 ~~2nd Qtr 2018 – 2nd Qtr 2022~~	2nd Qtr 2025 – 4th Qtr 2027
Nitrogen Oxides	~~172.33~~69.8	~~109.56~~93.1	~~84.57~~54.1	29.6
Carbon Monoxide	~~204.87~~107.6	~~148.92~~104.0	~~94.71~~59.5	26.2
Condensable Particulate Matter (PM_{10})	~~394.47~~44.0	~~138.25~~97.4	~~24.30~~23.0	35.3
Filterable Particulate Matter ($PM_{2.5}$)	~~88.62~~11.82	~~33.13~~22.9	~~7.57~~6.5	8.3
Volatile Organic Compounds	~~58.65~~44.3	~~32.38~~236.1	~~19.88~~563.8	73.0

Based on URBEMIS 2007 model methods for California

Table 3.2-8a
Estimated Maximum Daily Emissions from Construction of Each Phase of Alternative 8 (lbs/day)

	Phase 1	Phase 2	Phases 3A and 3B	Phase 4
	1st Qtr 2010 – 4th Qtr 2012	4th Qtr 2013 – 4th Qtr 2016	2nd Qtr 2017 – 4th Qtr 2019 1st Qtr 2022 - 4th Qtr 2024	2nd Qtr 2025 – 4th Qtr 2027
Nitrogen Oxides	82.7	39.9	54.1	29.6
Carbon Monoxide	111.4	45.2	100.4	26.2
Condensable Particulate Matter (PM_{10})	63.9	42.7	171.3	35.3
Filterable Particulate Matter ($PM_{2.5}$)	16.3	10.3	36.4	8.3
Volatile Organic Compounds	242.4	74.1	688.6	73.0

Based on URBEMIS 2007 model methods for California

The estimated emissions during construction of each phase would be considered minor short-term temporary impacts.

3.2.2.2 Operation

Stationary Sources

The build alternatives would all ~~increase~~expand the hospital area from 829,000 sf to approximately 2.4 million sf and the boiler capacity from 58,200 MBH to approximately 133,900 MBH, based on an engineering estimate. The new boiler emissions would be as shown in Table 3.2-9.

Table 3.2-9
Estimated Project Boiler Emissions for Build Alternatives (tons/year)

Pollutant	Existing Emissions	Emission Increase	Estimated Total Emissions
Nitrogen Oxides	5	5.75*	11
Carbon Monoxide	146	19*	165
Condensable Particulate Matter (PM_{10})	1.5	1.5	3
Filterable Particulate Matter ($PM_{2.5}$)	0.5	0.5	1
Volatile Organic Compounds	1.4	1.4	3

*Rod Pascua, personal communication

Emergency Generators

All alternatives would include the addition of new emergency generators. New generators would be located more centrally to the site and further from property lines, minimizing any potential emission impacts. Minor impacts would be continue to be expected from the existing and new generators as all would be required to meet City and regional air quality emission standards.

Mobile Sources

As with the existing conditions, the primary source of air emissions for all of the build alternatives would be from vehicle traffic. Based on the phasing described above, estimates were made of daily operation air emissions for all alternatives and phases and are shown in Table 3.2-10 through 3.2-12a.

Table 3.2-10
Estimated Maximum Daily Operations Emissions from Vehicles - Alternative 3 (lbs/day)

Pollutant	Alt 1 – No Action	Phase 1	Phase 2	Phase 3	Phase 4
		~~2nd~~ 1st Qtr ~~2012~~2013	~~1st~~ 3rd Qtr 2015	1st Qtr 2019	1st Qtr 2023
Nitrogen Oxides	18.41	24.19	39.17	10.13	16.46
Carbon Monoxide	148.83	201.09	325.56	92.72	171.92
Condensable Particulate Matter (PM_{10})	20.73	28.44	46.04	25.15	41.87
Filterable Particulate Matter ($PM_{2.5}$)	4.10	5.63	9.11	4.89	8.16
Volatile Organic Compounds	13.47	17.33	29.06	8.00	16.25

Based on URBEMIS 2007 model methods for California

Table 3.2-11
Estimated Maximum Daily Operations Emissions from Vehicles - Alternative 6 (lbs/day)

Pollutant	Phase 1	Phase 2	Phase 3	Phase 4
	4th Qtr 2012	3rd Qtr 2015	2nd Qtr 2019	1st Qtr 2023
Nitrogen Oxides	57.58	34.39	13.92	23.39
Carbon Monoxide	488.94	319.76	139.19	244.26
Condensable Particulate Matter (PM_{10})	72.61	58.72	26.57	59.48
Filterable Particulate Matter ($PM_{2.5}$)	14.34	11.43	5.20	11.60
Volatile Organic Compounds	42.52	28.05	13.49	23.08

Based on URBEMIS 2007 model methods for California

Table 3.2-12
Estimated Maximum Daily Operations Emissions from Vehicles - Alternative 7R (lbs/day)

Pollutant	Phase 1	Phase 2	Phase 3	Phase 4
	4th 1st Qtr 2012 2013	2nd 1st Qtr 2015 2017	3rd 1st Qtr 2022 2025	1st Qtr 2028
Nitrogen Oxides	137.3 109.35	82. 34.39	122.8 33.28	34.1
Carbon Monoxide	1,132.3 928.50	741.3 319.76	1,182.8 332.78	346.
Condensable Particulate Matter (PM_{10})	167.9 137.89	135.9 58.72	225.2 63.54	84.1
Filterable Particulate Matter ($PM_{2.5}$)	33.2 27.23	26.5 11.43	44.1 12.44	16.4
Volatile Organic Compounds	99.7 80.75	61.8 28.05	111.6 32.26	30.6

Based on URBEMIS 2007 model methods for California

Table 3-12a
Estimated Maximum Daily Operations Emissions from Vehicles - Alternative 8 (lbs/day)

Pollutant	Phase 1	Phase 2	Phase 3	Phase 4
	1st Qtr 2013	1st Qtr 2017	1st Qtr 2025	1st Qtr 2028
Nitrogen Oxides	137.6	30.6	156.4	34.1
Carbon Monoxide	1,135.3	274.7	1,512.6	346.0
Condensable Particulate Matter (PM_{10})	168.3	50.1	288.5	84.1
Filterable Particulate Matter ($PM_{2.5}$)	33.3	9.8	56.5	16.4
Volatile Organic Compounds	100.0	23.6	141.0	30.6

Based on URBEMIS 2007 model methods for California

Using the same model, an estimate was prepared for the estimated daily emissions at full build-out (Table 3.2-13).

Table 3.2-13
Estimated Maximum Daily Emissions from Operation of All Alternatives (Unmitigated) (lbs/day)

Pollutant	Hospital Emissions	Vehicular Emissions	Total Emissions
Nitrogen Oxides	10.49	161.92	172.41
Carbon Monoxide	10.40	1,345.93	1,356.33
Condensable Particulate Matter (PM_{10})	0.02	190.34	190.36
Filterable Particulate Matter ($PM_{2.5}$)	0.02	37.68	37.70
Volatile Organic Compounds	10.08	120.16	130.24

Based on URBEMIS 2007 model methods for California

Greenhouse Gas Emissions

An estimate of greenhouse gas emissions has been prepared for full build-out. For the hospital, the primary source is the burning of natural gas. This amount is still a very small number in comparison to the greenhouse gas emissions of the estimated traffic and would be less than .02 percent of the state's estimated total greenhouse gas emissions.

Table 3.2.14
Estimated Daily Greenhouse Gas Emissions from Operation of All Alternatives (Unmitigated)

Emission	Hospital Emissions (lbs/day)	Vehicular Emissions (lbs/day)	Total Emissions	
			lbs/day	tons/year
CO_2	12,570.75	114,070.53	126,641.28	23,112

Based on URBEMIS 2007 model methods for California

Using the GHG emission worksheet, total emissions are estimated at 4,275,328 $MTCO_2e$ as compared to 1,419,823 $MTCO_2e$ for the No ~~Action~~ Build Alternative. As noted above, these figures represents an estimate of GHG emissions created over the lifespan of the project, including those associated with manufacturing construction materials, fuel used during construction, energy consumed during facility operation, and transportation by employees. The GHG worksheet uses a standard project lifespan of 62.5 years. GHG emission worksheets for both the existing campus and expanded campus are included in Appendix A.

In comparison, the estimated GHG emissions generated throughout Seattle from all sources is approximately 11.6 million $MTCO_2e$ per year (725 million $MTCO_2e$ over the project lifespan). The estimated GHG emissions from Children's Master Plan build-out would be less than 0.6 percent of this City-wide amount.

Seattle is still in the early states of finalizing its measurement method, and the method used may be inexact. The Master Plan includes measures to mitigate green house gas emissions from construction, and no additional measures are required.

Wind

Wind impacts from the development alternatives are anticipated to be minimal; however, a wind study will be prepared as part of design for each phase of construction to ~~consider~~ control potential wind changes at the site once an alternative is selected and approved by the City Council. ~~It is anticipated that this study will be completed following the receipt of comments on the Draft Master Plan and included in the Final EIS.~~

The study is anticipated to include: (1) an examination of the effect of the proposed development alternatives on the surrounding neighborhood and roadways, (2) an examination of the effect at the base of the proposed buildings on vehicles and pedestrians, and (3) the potential flow of windborne particles and gases from mechanical equipment and other emission sources. The results of the study will be used to ensure that the development will be in compliance with the PSCAA Regulation I, Section 9.15.

Odor

Other than odors from vehicles, no perceived odors from hospital operations outside of any of the buildings are anticipated. If any odor source is identified by the City at the time of project permit issuance, the City and Children's will consult with PSCAA to assure regulatory compliance.

3.2.3 Mitigation Measures

3.2.3.1 Construction

- Children's would participate in project review with the PSCAA.
- Prior to demolition of the existing housing units at Laurelon Terrace under Alternatives 7R or 8, an ~~lead paint and~~ asbestos survey would be performed and an abatement plan be developed to prevent the releases into the atmosphere and to protect worker safety.
- The construction contractor(s) would be required to comply with PSCAA's Regulation I, Section 9.15, which requires reasonable precautions to avoid dust emissions.
- Electrical, non-CO-producing equipment would be used whenever possible.
- During construction, exposed soils and debris would be sprayed with water or other dust suppressants to reduce dust, truck wheels and undercarriages would be brushed/washed or pressure-sprayed before leaving the site, and truck loads and routes would be monitored to minimize impacts.
- To control particulate emissions, on-road trucks would use technology providing 85 percent particulate control.
- Both off-road diesel equipment and on-road diesel haul trucks would use cooled exhausts gas recirculation, aqueous diesel fuel, and diesel particulate filter.
- Backfill material would be stabilized during handling, when not actively being handled, and at the completion of activity.
- Water would be pre-applied to depth of proposed cuts, and re-applied as necessary to

maintain soils in a damp condition and to ensure that visible emissions do not extend more than 100 feet in any direction, and soils stabilized once earth-moving activities are complete.

- Material would be stabilized while loading to reduce fugitive dust emissions, at least six inches of freeboard would be maintained on haul vehicles, material would be stabilized while transporting to reduce fugitive dust emissions, and would be stabilized while unloading to reduce fugitive dust emissions.
- All off-road traffic, parking areas, and haul routes would be stabilized, and construction traffic directed over established haul routes.
- Surface soils would be stabilized where trencher or excavator and support equipment would operate, and soils stabilized at the completion of trenching activities.
- Prolonged periods of vehicle idling and engine-powered equipment would be avoided to reduce emissions.
- Delivery of materials that are transported by truck to and from the project area would be scheduled to minimize congestion during peak travel times on adjacent City streets. This would minimize secondary air quality impacts that would otherwise be caused by traffic having to travel at reduced speeds.
- Any exposed slopes/dirt would be covered with sheets of plastic.
- Perimeter railings around the new building would have mesh partitioning to prevent movement of debris during helicopter landings.

3.2.3.2 Operation

- Continued implementation of the Children's Transportation Management Program (TMP) would reduce air quality impacts related to longer-term vehicle use.
- "State-of-the-art" mechanical venting systems from Children's facilities would be used to minimize potential air quality impacts.
- Leaves and sticks and natural vegetation on and around the helistop would continue to be picked up on a regular basis.
- The City of Seattle is developing its own criteria to measure and mitigate for greenhouse gas emissions. At this time, no mitigation measures are required by the City. The City is currently using the greenhouse gas emission worksheet developed by King County. A greenhouse gas emission worksheet has been prepared for the full build-out of the project and is included in Appendix A along with the worksheet for the existing hospital emissions.

3.2.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts would be expected.

3.2.5 Secondary and Cumulative Impacts

Children's, in combination with other projects or general population growth and development in the area, would contribute to increased emissions temporarily during construction.

3.3 Water

3.3.1 Affected Environment

3.3.1.1 Groundwater

The geology of Children's campus and surrounding area consists of a deep deposit (almost 700 feet) of hard silt and clay. There are a number of zones of perched water that lie near the current ground surface but do not represent a static groundwater table. These underground zones of perched water often emerge as small isolated springs on the surface. On the west side of the hospital, adjacent to Laurelon Terrace, an area of perched water has a tendency to flow between old natural fill soils (above) and hard silts and clays (below). Possible leaks in the on-site irrigation in combination with the naturally-perched water could have been contributing to the water flow. Irrigation system repairs have been made to correct any known leaks in the system.

A project that will attempt to intercept additional groundwater on the western slope before it reaches the neighboring Laurelon Terrace property is currently under design. This project is expected to be implemented in 2008 and is anticipated to reduce perched water seepages observed in the existing soldier pile, timber lagging wall, and in the sloped hillside. The proposed drainage system will consist of a constructed block wall that will raise the grade to reduce any portions of the slope which are greater than 2:1 (height:vertical). The drainage system will intercept groundwater behind the wall and direct it to the existing french drain near the base of the wall.

The campus is not part of any deep aquifer recharge area, as the existing soils consist of hard clays and silts and are considered impermeable. Recently a deep emergency water well was drilled on site into an aquifer source that is over 700 feet below the surface. This drilling activity confirmed that groundwater is not present in any substantial quantity throughout the 700-foot depth of the glacially consolidated lacustrine silts and clays.

3.3.1.2 Stormwater

The existing drainage system for Children's campus is being analyzed for the master plan. Currently the campus is approximately ~~67~~ 46 percent pervious and ~~33~~ 54 percent impervious. The amount of water runoff and absorption is related to the impermeable surface area on the site.

The site has a typical private storm drainage system consisting of catch basins collecting surface flows, and perforated footing and subdrainage pipes picking up any perched water adjacent to buildings or structures. The storm flows are then conveyed through a few surface ditches but mostly through buried pipes, ranging from 6 inches to 14 inches in diameter, before discharging off site through six separate discharge areas and into the public storm drainage system. Each of these discharge areas conveys an unequal portion of the storm flows, with the largest portion being the Central basin consisting of approximately 10 acres, followed in size by the Southeast basin (4 acres), South-central basin (3 acres), Northeastern basin (2 acres), Northwestern basin (2 acres), and West basin (1 acre). The Central, Southeastern, and South-central basins discharge into the public drainage system in NE 45th Street, the Northeastern basin discharges to NE 50th

Street, the Northwest basin discharges to Sand Point Way NE, and the West basin discharges into the combined sewer located under 41st Avenue NE.

A portion of the existing Central basin drainage system does not have adequate capacity during some storm events. Measures are being pursued to lower a portion of this system to provide added capacity. The remaining basins have more than adequate capacity and have not had any reported drainage issues.

Numerous policies and regulations relate to drainage including the City's grading and drainage control ordinance. A drainage control plan detailing methods for collecting, controlling, transporting and disposing of stormwater entering, flowing within, and exiting the property under development is required prior to construction.

3.3.2 Impacts

3.3.2.1 All Alternatives

Groundwater

Construction
During construction, site preparation and excavation may expose or alter existing areas of underground perched water. If not controlled, properties lower in elevation than Children's could be affected by increased surface or subsurface water flows and result in a minor impact. Children's would comply with all applicable control requirements to minimize risks.

Operation
Development of individual projects with any of the alternatives is anticipated to require substantial excavation that would likely intercept the existing perched water. As part of any future development, below-grade drainage provisions, such as perforated sub-drainage and footing drain pipes or wall drains, would be incorporated into the design of the structure in order to maintain a dry interior of the building. The effect of this new construction would be beneficial, in that the new buildings would essentially serve as a sump that would intercept perched water up-gradient from Laurelon Terrace and reduce water flow.

All perched water would make its way to Union Bay primarily through a piped storm conveyance system. Existing flows currently migrate and discharge to Union Bay via subsurface flow and would continue to do so in the future through a piped conveyance system that would have an outfall in the same vicinity as where the natural groundwater enters the bay.

The deep aquifer (over 700 feet below the surface) would not be negatively affected by the proposed development, due to the impermeable existing soils and the aquifer depth.

The recharge capacity of the near-surface soils is low. Therefore, an increase in impervious area, as a result of development, is anticipated to have a comparatively small impact on groundwater recharge. A reduction in recharge could reduce potential spring activity and impacts to the adjacent Laurelon Terrace property.

Stormwater

Construction
During construction, site preparation and excavation may cause water quality and surface water runoff impacts. If not controlled, silt-laden runoff could clog catch basins and enter the City's drainage system and result in a minor impact. Children's would comply with all applicable drainage control requirements to minimize risks.

Operation
Alternative 1 would have an impervious surface area of ~~33~~ 52 percent. Alternatives 3, 6, ~~and~~ 7R and 8 are anticipated to have similar impervious surface areas of approximately ~~57~~67, ~~59~~69, ~~58~~66, and 67 percent, respectively. The proposed on-site drainage system would be designed and sized to convey at least the required 25-year storm per City of Seattle requirements. Part of the proposed design would include moving about six acres of stormwater flows from the Central basin to the Northwest basin, which would have available capacity. These storm flows ultimately combine in the same pipe system at the intersection of NE 45th Street and 40th Avenue NE. Additional stormwater flow due to any additional paved impervious surface area would affect storm drainage runoff conditions. Building area would not affect storm drainage flows.

Alternatives 7R and 8 would require that the City of Seattle vacate 41st Avenue NE and NE 46th Street between Sand Point Way NE and 40th Avenue NE. New drainage systems would be required on this lower portion of property and would likely connect into drainage systems on both Sand Point Way NE and 40th Avenue NE.

The dedicated public storm drains adjacent to Children's combine with a direct outfall to Union Bay. Union Bay is considered a designated receiving water body by the Washington State Department of Fish and Wildlife, Washington State Department of Ecology, and the City of Seattle. Since the site is served by dedicated storm lines that are estimated to have adequate capacity and directly outfall to a receiving water body, stormwater flow control (detention) is not required.

Stormwater from new on-site roadways and parking lots would be cleaned and treated per City of Seattle requirements. There are several different systems to treat the required runoff, such as vaults, bioswales, filter systems, and rain gardens.

3.3.3 Mitigation Measures

During both construction and operation:

- Children's would comply with all applicable requirements related to surface water runoff control and water quality.
- A drainage control plan would be prepared to City requirements.

3.3.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts would be expected.

3.3.5 Secondary and Cumulative Impacts

The increase in impervious surface would be a minor contributor to secondary and cumulative increased flows in surface water runoff.

3.4 Energy and Natural Resources

3.4.1 Affected Environment

3.4.1.1 Natural Gas

Children's physical plant consists of four industrial water-tube natural gas-fired boilers with diesel oil as back-up fuel; each is rated at 14,550 MBH. These boilers supply steam for heating, cooking, and sterilization. Out of the six total exhaust stacks, four serve the boilers. The consumption of natural gas from July 2006 to July 2007 was 1,537,476 therms (Table 3.4-1).

Table 3.4-1
Average Monthly Gas Consumption, July 2006 – July 2007

Date	Days in Period	Average Temperature	Degree Days[1]	Energy Therms	Average Therms/Day
2007					
July	31	66	25	95887	3093
June	30	59	175	99152	3305
May	31	55	304	109484	3532
April	30	51	413	119256	3975
March	31	49	483	136513	4404
February	28	45	537	130092	4646
January	31	41	740	171946	5547
2006					
December	31	42	684	154744	4992
November	30	46	568	134147	4472
October	31	53	353	109481	3532
September	30	62	92	97288	3243
August	31	66	27	94404	3045
July	31	67	22	85082	2745
Total				1,537,476	

[1]Degree Day = a quantitative index to reflect demand for energy to heat or cool houses and businesses

3.4.1.2 Electricity

The electrical service needs of Children's are provided by Seattle City Light. Children's has the following electrical facilities:

- Two 2,500 kilovolt amperes (kVA) transformers at the Whale Wing Service
- Two 2,000 kVA transformers at the main hospital service (C-wing)
- One 2,000 kVA transformer at the Giraffe Wing Service
- One 900 kVA transformer at the Airplane Wing Service
- One 112 1/5 kVA at the Whale Garage Service
- Additional services for the Giraffe Garage, facilities trailer, and landscape building
- One 850-ton, three 600-ton, and one 430-ton electric chillers at the air conditioning plant

The consumption of electricity from July 2006 to July 2007 was approximately 24,035,545 kilowatt (kW) hours (Table 3.4-2). The consumption of electricity from October 2006 to October 2007 for the Hartmann building was 4,030,215 kW hours (Table 3.4-3).

Table 3.4-2
Average Hospital Monthly Electrical Consumption,
July 2006 – July 2007

Date	KW Hours Used
2007	
July	2,166,319
June	2,023,873
May	1,525,057
April	1,390,685
March	1,460,083
February	1,512,621
January	1,948,744
2006	
December	1,582,615
November	*1,898,251
October	*1,800,509
September	2,309,460
August	2,160,706
July	2,256,622
Total	24,035,545

*These numbers are an approximation.

Table 3.4-3
Average Monthly Electrical Consumption,
October 2006 – October 2007
Hartmann Building

Date	Days in Period	Average Temperature	Electrical Kilowatt Hours	Electrical Demand (kW)	Average kW/Day
2007					
October	31	51	247,062	444	7,970
September	30	60	256,054	473	8,535
August	31	66	285,484	485	9,209
July	31	68	291,974	516	9,419
June	30	60	277,601	489	9,253
May	31	57	281,725	512	9,088
April	30	51	264,631	438	8,821
March	31	47	281,725	415	9,088
February	28	44	248,341	426	8,869
January	31	38	273,842	438	8,834
2006					
December	31	41	262,257	416	8,460
November	30	44	273,842	440	9,128
October	31	52	249,578	460	8,051
Total			4,030,215		

3.4.1.3 Diesel

The current emergency power system consists of three 250 kW, two 500 kW, and one 600 kW emergency diesel generators. These generators are for emergency use only and are turned on when power loss occurs or when power loss is anticipated, such as during a severe wind storm. The emergency generators are turned on once per week, tested once per month, and have a four-hour long test once per year. When operating, these generators use about 140 gallons per hour. The west generator plant has two 550 kW and two 1,250 kW units, the Airplane wing has one 600 kW unit, and the east generator plant has two 900 kW units.

Out of the six total exhaust stacks, two serve the emergency generators while the other four serve the natural gas boilers.

3.4.1.4 Solar Heating

Solar reflectance index (SRI) is a measure of a roof's ability to reject solar heat, as detected by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is zero and a standard white (reflectance 0.80, emittance 0.90) is 100. For example, the standard

black has a temperature rise of 90 degrees Fahrenheit in full sun, and the standard white has a temperature rise of 14.6 degrees Fahrenheit. Once the maximum temperature rise of a given material has been computed, the SRI can be computed by interpolating between the values for white and black. Materials with the highest SRI values are the coolest choices for roofing. Due to the way SRI is defined, particularly hot materials can even take slightly negative values, and particularly cool materials can even exceed 100.

An SRI value of 46 was computed for Children's, based on a conservative approximation of materials used in existing roofing materials. The calculations were based on industry-standard roofing material SRI from the Lawrence Berkeley National Laboratory.

3.4.2 Impacts

3.4.2.1 Common to All Alternatives

Children's elected to plan under the Green Guide for Health Care program (a voluntary program aimed at protecting the health of building occupants). Energy goals in the Green Guide for Health Care program include increasing the energy star score, utilizing on-site and/or off-site renewable energy, and using energy efficient equipment. Children's would implement energy-saving measures using standards by the Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ or measures of other appropriate organizations.

Construction of any of the alternatives would result in a minor impact due to the use of construction equipment primarily fueled with diesel. No significant impacts are expected.

3.4.2.2 Alternative 1

Natural Gas

The amount of natural gas needed for Alternative 1, build-out of the remaining development area as allowed by the existing Master Plan, would be approximately 1,669,500 therms per year, using current natural gas usage rates per square foot. This would be an increase of 132,024 therms per year. However, it is Children's goal to reduce all energy consumption by 25 percent using the Green Guide for Health Care program. A 25 percent reduction would result in approximately 1,252,125 therms per year. The pipes and distribution system serving Children's would have the capacity needed to provide the necessary natural gas.

Electricity

The amount of electricity needed for Alternative 1 would be approximately 26,091,000 kW hours per year, using current electrical usage rates per square foot. This estimate would be an increase of approximately 2,055,455 kW hours per year above current usage. Children's goal to reduce energy consumption by 25 percent would reduce anticipated electricity consumption to approximately 19,568,250 kW hours per year, approximately 4,467,295 kW hours lower than current electrical use. The increased electrical needs would continue to be met by Seattle City Light with ample available capacity.

Energy usage on the Hartmann property would be expected to remain at current levels, which is approximately 3,494,116 kW hours per year.

These increased demands would not impact the Laurelhurst community as no power spikes would be expected and all electrical needs would continue to be met. The Laurelhurst community benefits from the location of Children's, as hospitals (and everyone on the same grid) are one of the first facilities to have electricity restored after an outage.

Solar Heat

An SRI value of 49 was computed for Alternative 1, based on a conservative approximation of materials to be used for roofing materials. Actual SRI values could vary from estimates and higher SRI-valued materials continue to be introduced on the market. This value represents a potential reduction or similar amount of heat contained in the project area compared to today.

3.4.2.3 Alternatives 3, 6, ~~and~~ 7R and 8

Children's Hospital currently includes approximately 900,000 sf. ~~All~~ Each of the build alternatives would result in ~~propose an increase of 2.23 million sf on campus and 170,000 sf on the Hartmann property, for~~ a total of 2.4 million sf. The additional square footage for each build alternative is as follows: for Alternatives 3 and 6, an increase of 1.33 million sf on campus and 170,000 sf on the Hartmann property; for Alternative 7, an increase of 1.35 million sf on campus and 150,000 sf on the Hartmann property; and for Alternative 8, an increase of 1.5 million sf on campus and no redevelopment of the Hartmann property. All build alternatives would total the same amount of square footage.

Natural Gas

The amount of natural gas needed for each build alternative would be approximately 4,452,000 therms per year, using current natural gas usage rates per square foot. This would be an increase of 2,914,524 therms per year. Children's goal to reduce energy consumption by 25 percent would reduce anticipated natural gas consumption to approximately 3,339,000 therms per year, approximately two times the current amount of natural gas used. The pipes and distribution system serving Children's would have the capacity needed to provide the necessary natural gas.

Electricity

The amount of electricity needed for each build alternative would be approximately 69,576,000 kW hours per year, using current electrical usage rates per square foot. This estimate would be an increase of approximately 45,540,455 kW hours per year above current usage. Children's goal to reduce energy consumption by 25 percent would reduce anticipated electricity consumption to approximately 52,182,000 kW hours per year, approximately 28 million more kW hours per year than current levels. The increased electrical needs would continue to be met by Seattle City Light with ample available capacity. These increased demands would not impact the Laurelhurst community, as no power spikes would be expected and all electrical needs would continue to be met.

Solar Heat

SRI values of 58, 60, 61, and 61 were computed for Alternatives 3, 6, ~~and~~ 7R and 8, respectively, based on a conservative approximation of materials to be used for roofing materials. Actual SRI values could vary from estimates and higher SRI-valued materials continue to be introduced on the market. This value represents a potential reduction in heat contained in the project area.

3.4.3 Mitigation Measures

3.4.3.1 Construction

- Construction materials would be reused and recycled to the extent feasible.

3.4.3.2 Operation

- Children's would implement energy-saving measures using standards by the Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ or measures of other appropriate organizations.
- Children's would meet the requirements of the 2004 Seattle Energy Code, Chapters 11 through 15.

3.4.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts would be expected.

3.4.5 Secondary and Cumulative Impacts

No secondary or cumulative impacts would be expected.

3.5 Noise

3.5.1 Affected Environment

The primary sources of outdoor noise at the existing hospital are the ventilation for heating and cooling systems; traffic; and landings and takeoffs of helicopters. The helicopter noise, which is by far the loudest noise source, is discussed in detail in Appendix B.

Children's is located adjacent to a residential neighborhood. Existing off-site noise is primarily caused by traffic on adjacent roadways including Sand Point Way NE and NE 45th Street.

3.5.1.1 Noise Modeling Methodology

Wyle Laboratories performed noise analyses regarding existing and proposed Agusta A109[1] emergency helicopter operations at Children's. The A109 is considered a light high-speed twin-engined four-bladed general purpose helicopter with a length of approximately 43 feet, a main rotor diameter of approximately 36 feet and a maximum takeoff weight of approximately 5,400 pounds. Its maximum cruising speed is 165 miles per hour with a maximum climb rate of 1,620 feet per minute (Gunston 1980).

As topography and shielding effects are a concern, Wyle modeled the existing and proposed emergency helicopter operations using the Department of Defense's NOISEMAP Version 7.2 computer program. NOISEMAP can model the effects of ground cover, elevation, and shielding, and contains acoustic source data for the subject Agusta A109 helicopter. The existing hospital buildings and the proposed buildings~~, including the proposed building for the helipad,~~ were modeled as landform plateaus. A different elevation and impedance file set was created for each building scenario (existing, interim, and each Build Alternative). Considering only the helicopter noise during departure and arrival, day-night average sound level (DNL), sound exposure level (SEL) and instantaneous maximum sound level (Lmax) were computed for 12 points of interest (noise-sensitive receptors) for four operational conditions associated with the helipad's location.

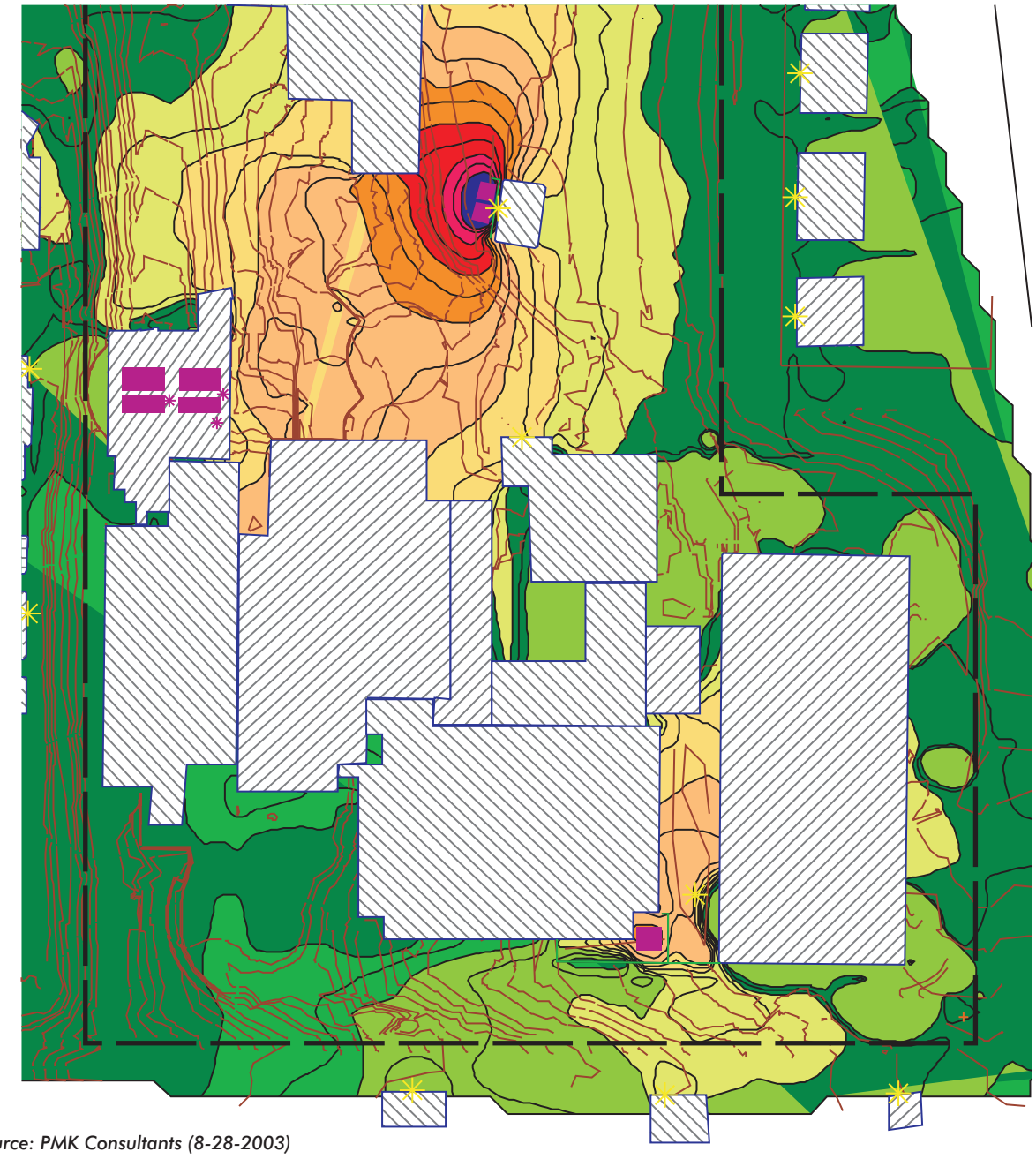
3.5.1.2 Existing Noise Levels

Figure 3.5-1 shows existing noise levels for surrounding residential properties during nighttime hours (10:00 pm to 7:00 am). Noise levels at Laurelon Terrace range from 25 to 35 A-weighted decibels (dBA). Noise levels at homes to the east of Children's are approximately 25 dBA. Nighttime noise levels at homes to the south of Children's across 45th Street NE are between 35 and 40 dBA primarily due to traffic on 45th Street NE.

Neighbors have complained to Children's about noise coming from ventilation equipment (such as loud fan noise) on the top of the Airplane building and near the Whale Garage which is currently noticeable to them during evening hours when traffic noise is lower.

[1] In October 2009, Airlift Northwest informed URS that they would be adding a new aircraft, the American Eurocopter EC-135 TC. In takeoff and flyover, the EC-135 is anticipated to be 4 to 6 dB quieter than the levels predicted in this analysis for the Agusta A-109. On approach, it may be 1 to 3 dB higher.

33759484_01.cdr



Legend

- Industrial sources point
- Industrial sources area
- Main building
- Screen foot
- Screening edge
- Elevation point
- Elevation line
- Receiver

Noise level
Night
in dB(A)

	<= 25
25 <	<= 30
30 <	<= 35
35 <	<= 40
40 <	<= 45
45 <	<= 50
50 <	<= 55
55 <	<= 60
60 <	<= 65
65 <	

Source: PMK Consultants (8-28-2003)

Figure 3.5-1

Existing Noise Level - Nighttime Operation

Currently, emergency aircraft operate from a helipad located south of the main driveway and north of the hospital building. The helipad is on the ground at an elevation of 130 feet above mean sea level (msl).

Flight operations at Children's are relative to the nature of emergency treatment in the region and are unpredictable. On average, Children's typically receives four landings[2] each month with three occurring during the daytime (7:00 am to 10:00 pm) landings and one at nighttime (10:00 pm to 7:00 am). However, emergency flights on a given day have been as frequent as two during the daytime hours and two during the nighttime period.

Two types of DNL were computed: Average Day DNL based on three monthly daytime landings and one monthly nighttime landing, and "Busiest Day" DNL based on two daytime landings and two nighttime landings. Other than the helipad's location, the only differences between the operational conditions were the minor differences in flight tracks and associated flight profiles for each helipad location; numbers of operations on each track were identical for each condition.

Table 3.5-1 shows the two sets of operations counts modeled for this project. The Average Day scenario totals 0.26 average daily operations, while the Busiest Day scenario totals eight average daily operations, with half of those operations during the nighttime period.

Table 3.5-1
Existing Emergency Flight Operations

Scenario	Operation Type	Average Daily Flight Operations		
		Day	**Night**	**Total**
Average Day	Departure	0.10	0.03	0.13
	Arrival	0.10	0.03	0.13
	Total	**0.20**	**0.06**	**0.26**
Busiest Day	Departure	2	2	4
	Arrival	2	2	4
	Total	**4**	**4**	**8**

Note: Daytime is from 7:00 am until 10:00 pm, nighttime is from 10:00 pm until 7:00 am.

Table 3.5-2 lists the calculated noise exposure values for 12 modeled receptors. In addition to the 10 receptor locations previously modeled by URS, Wyle also modeled Receptor Location R1 (4720-24 44th Avenue NE) and Receptor Location R2 (4530 45th Avenue NE) from the 1991 FEIS for direct comparison, and they are shown below as R11 and R12. Among the 12 receptors, DNLs range from 35 dBA to 63 dBA, Lmax ranges from 72 dBA to 90 dBA and SELs range from 89 dBA to 102 dBA. Receptor R7 at 4200 NE 50th Street experiences the highest DNLs (47 dBA for an average day and 63 dBA for a busy day) but Receptor R11 along 44th Avenue experiences the highest Lmax (90 dBA). As indicated by the rightmost column of Table 3.5-2, all of the maximum SELs are due to arrival flights. See Figure 3.5-2 for the modeled noise receptor locations and modeled flight paths for the existing helipad.

[2] A "landing" includes two helicopter flight operations – an arrival and a departure.

Table 3.5-2
Existing Modeled Noise Levels

Receptor		Noise Level (dBA)				Max SEL Track
ID	Address	AD[a] DNL	BD[b] DNL	Lmax	Max SEL	
R1	Laurelon Terrace, northernmost building	44	60	85	98	EA02
R2	Laurelon Terrace, south of R1	44	60	81	97	EA02
R3	4323 NE 45th St.	35	52	73	89	EA01
R4	4546 45th Ave. NE	38	54	73	92	EA04
R5	4554 45th Ave. NE	38	54	76	92	EA04
R6	4702 45th Ave. NE	45	61	89	101	EA04
R7	4200 NE 50th St.	47	63	89	102	EA03
R8	4545 Sand Point Way	41	57	87	98	EA01
R9	4412 43rd Ave. NE	35	52	75	90	EA01
R10	4415 43rd Ave. NE	36	52	77	91	EA01
R11	4720-4724 44th Ave. NE	46	62	90	101	EA04
R12	4530 45th Ave. NE	36	53	72	90	EA04

[a]AD = Average Day is 3 daytime landings and 1 nighttime landing per month
[b] BD = Busiest Day is 2 daytime landings and 2 nighttime landings per day
Daytime is from 7:00 am until 10:00 pm, nighttime is from 10:00 pm until 7:00 am.
All receptor elevations are assumed to be 5 ft above ground level.

DNL = Day-Night Average Sound Level
Lmax = Maximum Sound Level
SEL = Sound Exposure Level
dBA = A-weighted decibels re 20 µPa

3.5.2 Impacts

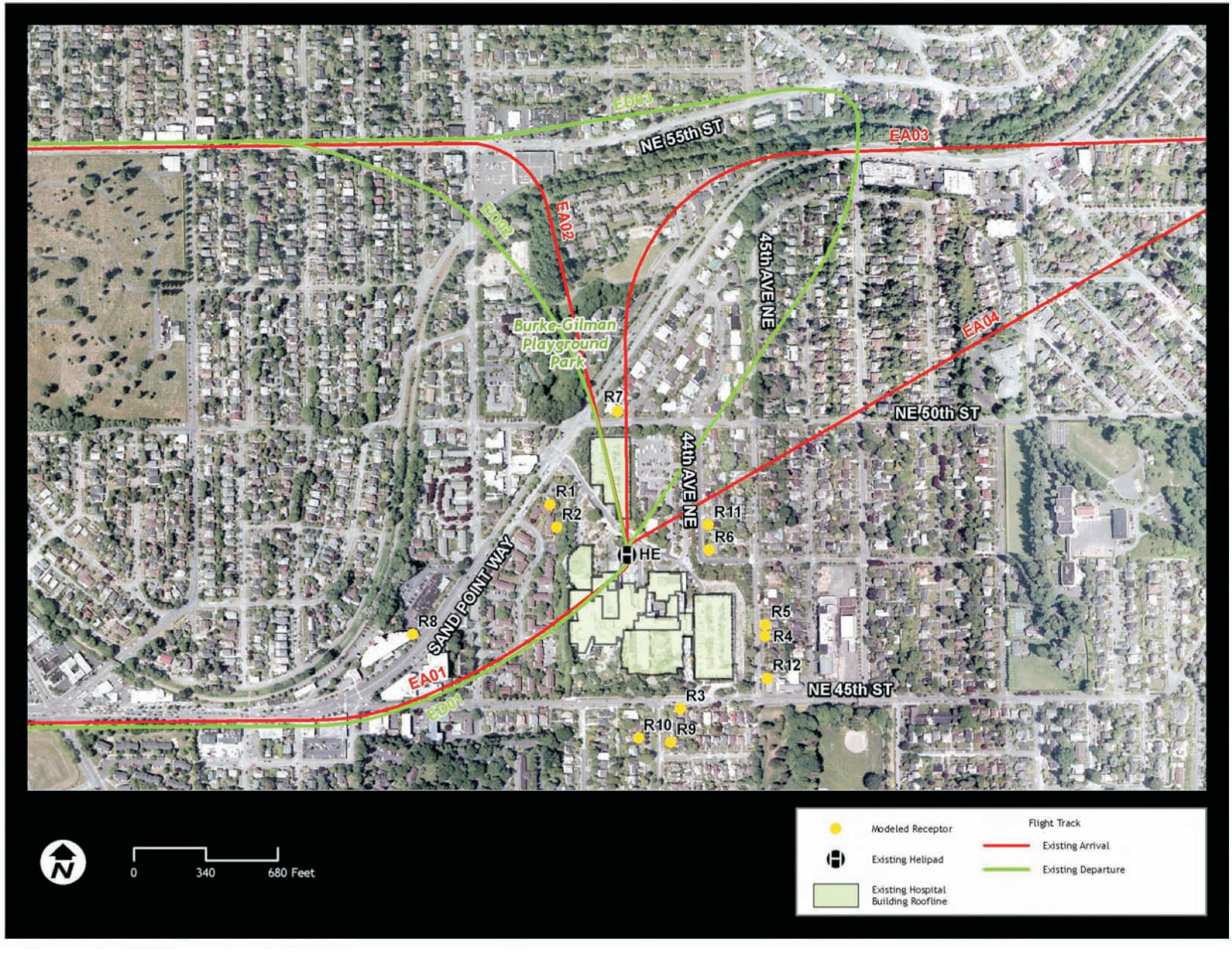
3.5.2.1 Construction

Construction Equipment

Construction noise would occur with the development of projects over the proposed ~~15~~ 20 year Master Plan period. Noise would result from demolition, excavation activities, structure erection and ~~construction~~interior work. Currently there are ~~three~~ four alternatives for the location of the new buildings in the Master Plan. The layouts for these ~~three~~ four alternatives (Alternatives 3, 6, 7R, and 8) are shown in ~~the~~ Figures 2-2 through 2-4a in Section 2. Construction noise for each alternative will impact the surrounding neighborhood differently due to the location and timing of the construction of the proposed buildings.

The Seattle Noise Ordinance maximum permissible noise levels are shown in Table 3.5-3. Seattle Children's Hospital is a major institution overlay in a residential district and the surrounding area is a residential district. This means the maximum permissible noise levels that can be generated by its operations are 55 dBA Daytime and 45 dBA nighttime per section 25.08.410 of the Seattle Municipal Code.

33759484_10.cdr



Source: Wyle and CHRMC, 2007

Figure 3.5-2
Modeled Flight Tracks for Existing Helipad

Table 3.5-3
Seattle Noise Code Maximum Permissible Noise Levels

District Sound Source	District of Receiving Property				
	Residential		Commercial		Industrial
	Day	Night	Day	Night	Day or Night
Rural	52 (dBA)	42 (dBA)	52 (dBA)	52 (dBA)	52 (dBA)
Residential	55 (dBA)	45 (dBA)	52 (dBA)	52 (dBA)	52 (dBA)
Commercial	57 (dBA)	47 (dBA)	52 (dBA)	52 (dBA)	52 (dBA)
Industrial	60 (dBA)	50 (dBA)	52 (dBA)	52 (dBA)	52 (dBA)

Construction Noise is addressed under the Seattle Municipal Code Section 25.08.425. During construction, the maximum permissible sound levels presented in Table 3.5-3 as measured from the real property of another person may be exceeded between the hours of 7:00 am and 10:00 pm on weekdays and between the hours of 9:00 am and 10:00 pm on weekends by no more than the following dBAs for the following types of equipment:

1. Twenty-five (25) dBA for equipment on construction sites, including but not limited to crawlers, tractors, dozers, rotary drills and augers, loaders, power shovels, cranes, derricks, graders, off-highway trucks, ditchers, trenchers, compactors, compressors, and pneumatic powered equipment.
2. Twenty (20) dBA for portable powered equipment used in temporary locations in support of construction activities or used in the maintenance of public facilities, including but not limited to chainsaws, log chippers, lawn and garden maintenance equipment, and powered hand tools.
3. Fifteen (15) dBA for powered equipment used in temporary or periodic maintenance or repair of the grounds and appurtenances of residential property, including but not limited to lawnmowers, powered hand tools, snow removal equipment, and composters.

Sounds created by impact types of construction equipment including but not limited to pavement breakers, pile drivers, jackhammers, sandblasting tools, or by other types of equipment or devices which create an impulsive noise or impact noise or are used as impact equipment, as measured at the property line or fifty feet (50') from the equipment, whichever is greater, may exceed the maximum permissible sound levels presented in Table 3.5-3 in any one (1) hour period between the hours of 8:00 AM and 5:00 PM on weekdays only, but in no event to exceed the following:

1. L_{eq} ninety (90) dBA continuously
2. L_{eq} ninety-three (93) dBA for thirty minutes
3. L_{eq} ninety-six (96) dBA for fifteen minutes
4. L_{eq} ninety-nine (99) dBA for seven and one half minutes

Sound levels in excess of L_{eq} ninety-nine (99) dBA are prohibited unless authorized by variance.

The impact of the construction noise for the ~~three~~ four alternatives was predicted for the various construction activities. Noise generated by the expected construction activities falls into four broad categories: demolition, excavation, structure erection and interiors. Using the published noise sources for each stage of the construction process and standard noise attention models, the noise levels at each of neighboring property lines from each of the proposed buildings was estimated.

The expected noise levels for each category of noise have distinct attributes. One attribute that the categories of noise do have in common is that none of them are a constant noise level. Each activity has times when machinery may be louder or quieter or even shut off for periods of time. For example, demolition of a building consists of reducing the structure of the building to forms which can be transported from the site. This process involves dismantling the structure, separating the various types of materials (concrete, steel, etc.) and reducing the size or form of the materials for transportation from the site. This does not produce a steady state noise, such as an engine running, but rather many peaks and valleys in the noise level. Excavation noise may be more constant than demolition noise but also varies with time, and construction noise also has an amplitude that fluctuates with time.

Figure 3.5-3[3] shows typical demolition and excavation noise measurements from a local building site measured over a one week period. As shown in the figure, the noise levels from the site vary in duration and amplitude in a random fashion. The term equivalent noise level (Leq) is used to represent a varying noise level as a single value. Leq is defined as the level of a constant sound over a specific time period that has the same sound energy as the actual varying sound over the same period of time. This is similar to an arithmetic average.

Figure 3.5-3a represents hourly Leq data from a job site over a one week period of time. Fluctuations in noise level within any one hour are represented in Figure 3.5-3b.

The red line in Figure 3.5-3a represents the daily equivalent noise level (Leq) that corresponds to the peaks and valleys of the blue line. It essentially gives the average noise level for each one day period. The green line is the equivalent noise level for the entire week. Although it is a single level that represents noise activities over a period of time, it is important to keep in mind that the actual noise levels within that period of time will fluctuate above and below the Leq level.

In order to predict noise levels at the adjacent property lines from a varying noise source, the levels were converted into Leqs to represent an average value for a construction event over a period of time. These equivalent values were used in our analysis. This means that if a noise level is predicted to be a certain Leq, the actual noise level may be higher or lower than the Leq within the duration of the activity.

[3] Data shown in this graph do not represent absolute noise levels of the Children's Hospital master plan construction, but rather are intended to represent the fluctuations of noise levels at a typical construction site over a period of time.

Figure 3.5-3b

Figure 3.5-3a

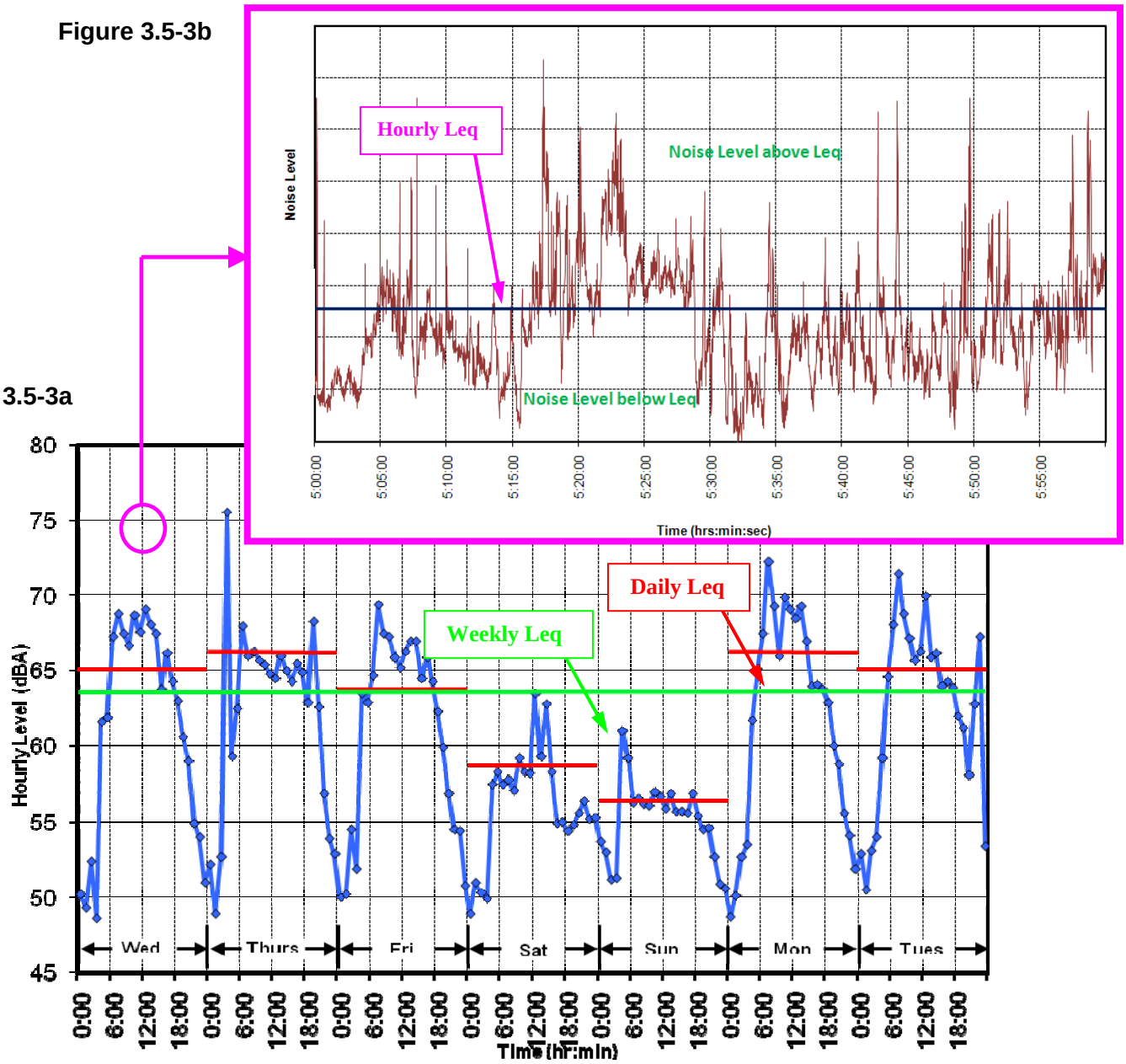


Figure 3.5-3
Measured Demolition and Excavation Noise Levels with Leqs

Figures 3.5-4, 3.5-5, ~~and~~ 3.5-6, and 3.5-6a show the expected noise levels from the various actives involved in the construction of the proposed new buildings on Children's campus over the next 20 years. The diagrams show different phases of construction (demolition, excavation, structure erection, and interior work) for each of the ~~three~~ four alternatives.

Each alternative has four diagrams that give the predicted noise levels from each building relative to the north, south, east and west property lines of the campus. It is important to note that ~~in all three Build Alternatives,~~ the Hartmann property is located west of the campus across

Sand Point Way NE. Predicted noise levels for this property are relative to its nearest neighboring property lines which are not the same as for the rest of the campus. With Alternative 8, there would be no redevelopment of the Hartmann property.

The diagrams also show maximum and minimum predicted noise levels at each property line. The hatched area shown for each location represents the range of noise levels that can be expected for the various activities depending on construction location and equipment staging on the site.

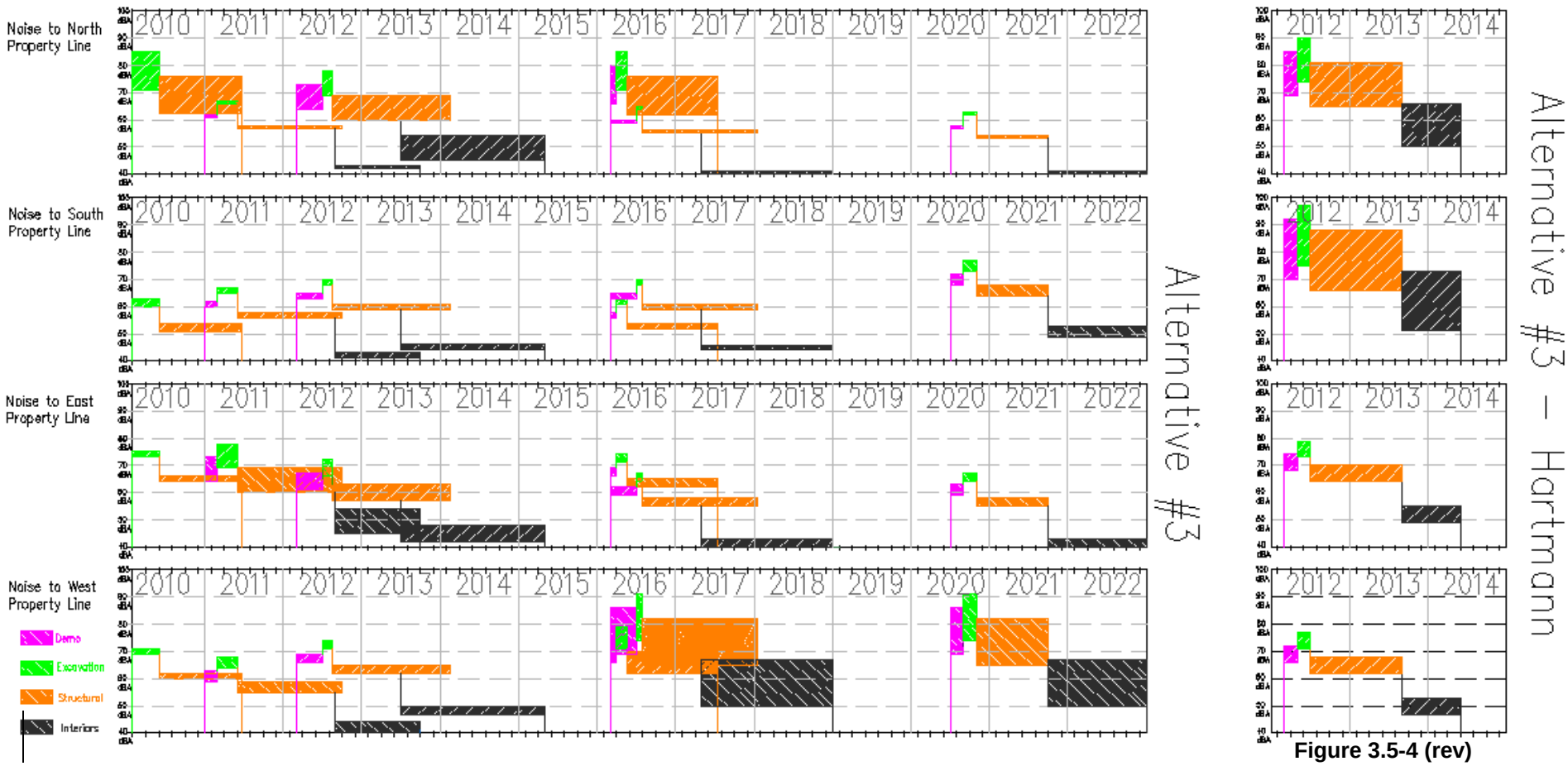


Figure 3.5-4 (rev)
Predicted Noise Levels – Alternative 3

The decibel scale on the left side of the table ranges from a low of 40 dBA to a high of 100 dBA, in 10 dBA increments. For the first two phases of Alternative 3, the noisiest construction activities would be the excavation (shown in green) and would have the largest impact to residents to the north of Children's. Noise levels would range between 70 and 85 dBA at the north property line. Redevelopment of the Hartmann site would occur during the second phase beginning in 2012. Excavation (shown in green) and demolition (shown in pink) would be the noisiest activities. The largest impact would be to residents to the south due to the proximity of existing housing.

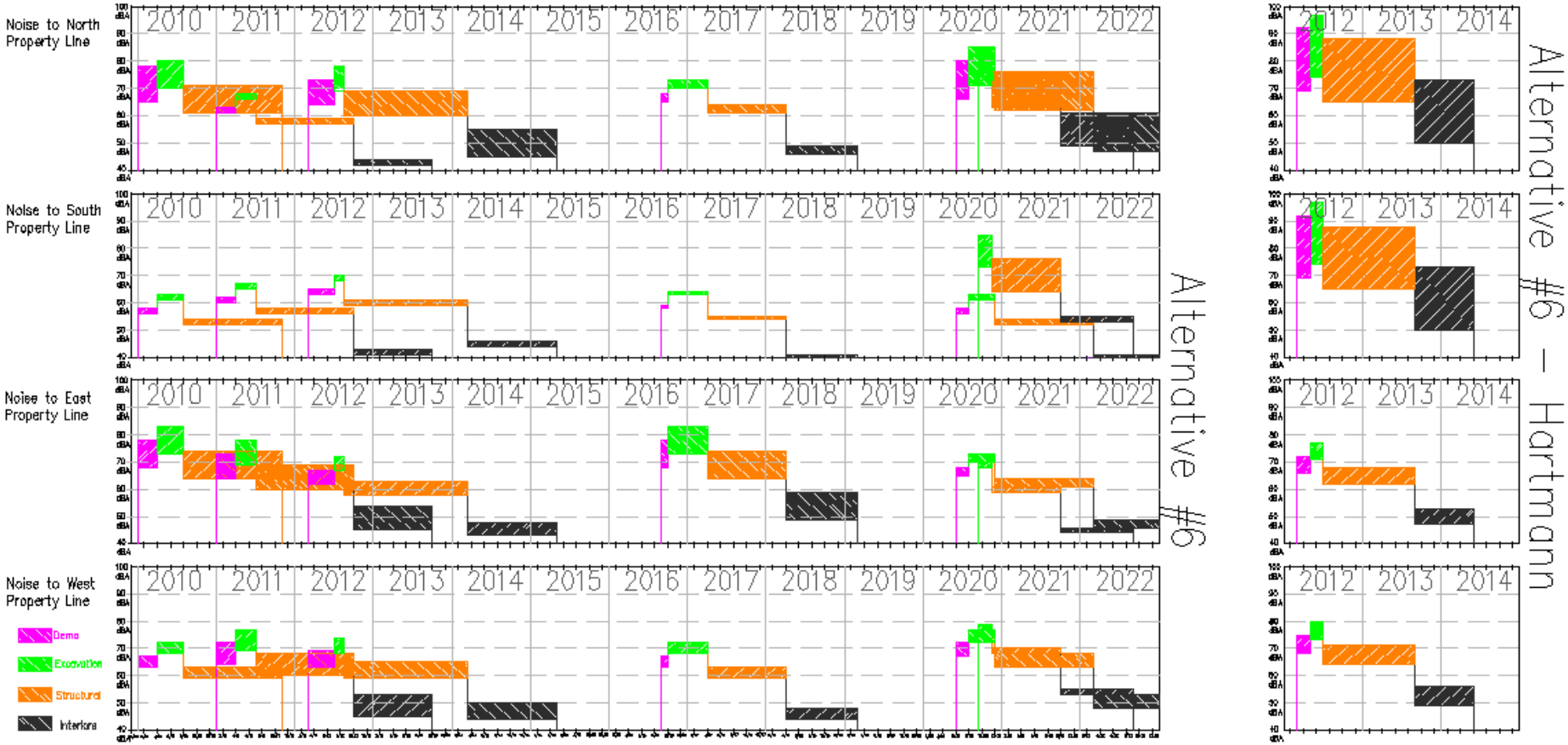


Figure 3.5-5 (rev)

Predicted Noise Levels – Alternative 6

The decibel scale on the left side of the table ranges from a low of 40 dBA to a high of 100 dBA, in 10 dBA increments. For the first two phases of Alternative 6, the noisiest construction activities would be the excavation (shown in green) and would have the largest impact to residents to the east of Children's. Noise levels would range between 75 and 85 dBA at the east property line. Redevelopment of the Hartmann site would occur during the second phase beginning in 2012. Excavation (shown in green) and demolition (shown in pink) would be the noisiest activities. The largest impact would be to residents to the south due to the proximity of existing housing.

Figure 3.5-6 rev
Predicted Noise Levels - Alternative 7R

The decibel scale on the left side of the table ranges from a low of 40 dBA to a high of 100 dBA, in 10 dBA increments. For the first two phases of Alternative 7R, the noisiest construction activities would be the excavation (shown in green) and would have the largest impact to residents to the north and west of Children's. Noise levels would range between 70 and 95 dBA at the north and west property lines. Redevelopment of the Hartmann site would occur during the second phase beginning at the end of 2015. Excavation (shown in green) and demolition (shown in pink) would be the noisiest activities. Because the building would be shaped and located on the site differently from the configuration shown for Alternatives 3 and 6, noise impacts would occur similarly to residents on all sides of the property.

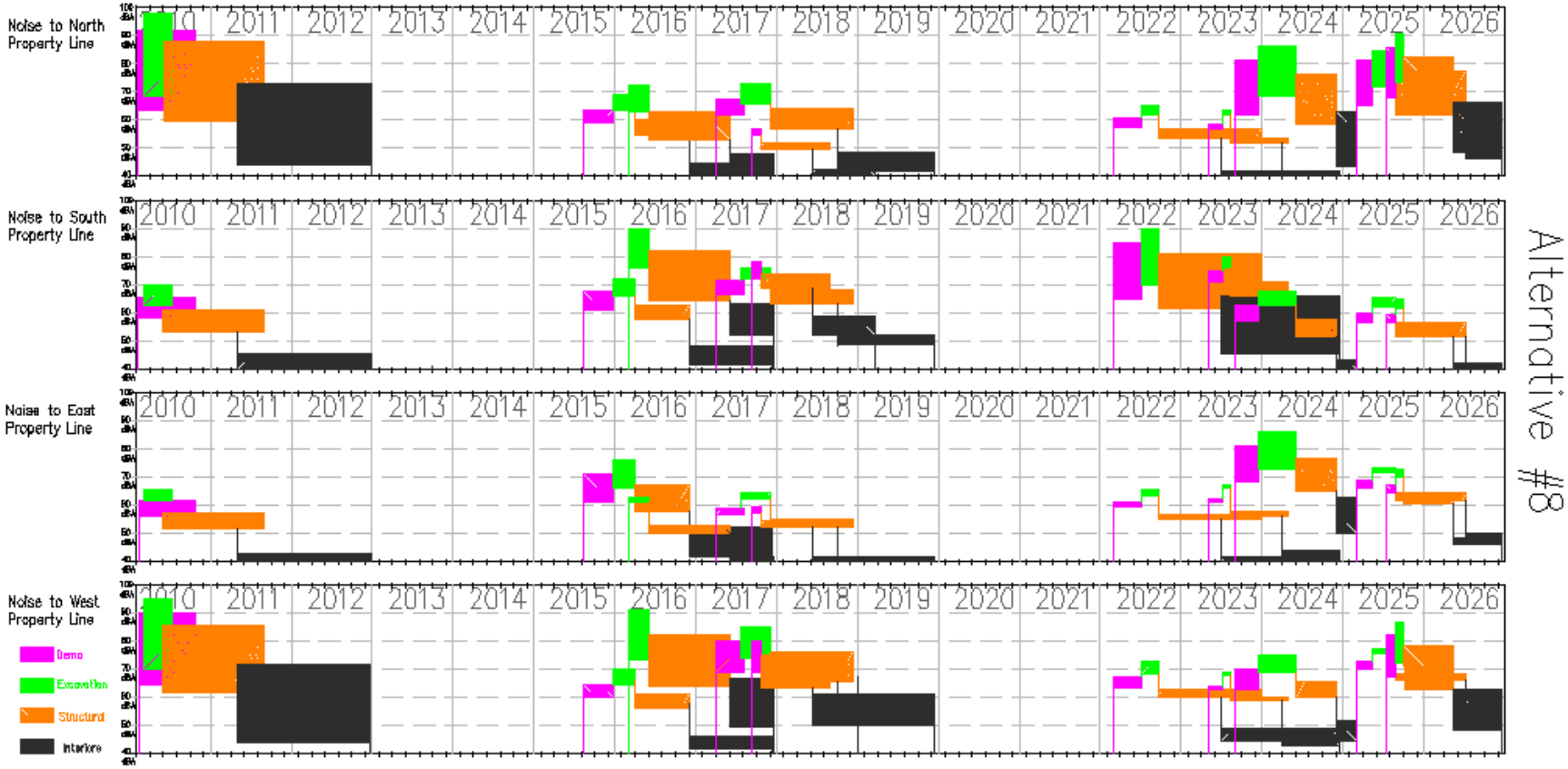


Figure 3.5-6a
Predicted Noise Levels – Alternative 8

The decibel scale on the left side of the table ranges from a low of 40 dBA to a high of 100 dBA, in 10 dBA increments. For the first two phases of Alternative 8, the noisiest construction activities would be the excavation (shown in green) and would have the largest impact to residents to the north and west of Children's. Noise levels would range between 70 and 95 dBA at the north and west property lines. The Hartmann site would be excluded from the MIO in this alternative, so no redevelopment is currently proposed.

The study models likely noise levels for each neighboring property by assuming a range of locations for noise sources. For each property, the model considers one point source located at the nearest edge of the construction site relative to the neighboring property and another point source at the farthest edge. This is shown in Figure 3.5-7.

Figure 3.5-7
Range of Construction Noise

The noise level predictions in Table 3.5-4 are based on most commonly used data to predict construction noise. Future changes in construction equipment and practices may affect the actual noise generated by construction over the estimated 20-year timeframe. Because the predictions are based on the generic noise levels, the actual construction noise on the site may be different due to the particular nature of construction process on the site at any given time. The predicted noise levels provide a general indication of the expected noise levels and basis on which to compare the noise impact of the ~~three~~ four Build Alternatives.

The results of the noise predictions show that construction activities for certain buildings exceed the 55 dBA noise plus the 25 dB (80 dBA total) allowance for temporary construction noise. In certain cases, due to close proximity of adjacent property lines, construction activities will exceed the 90 dBA limit set for certain construction activities and durations. In these instances, it was not able to be determined whether noise from construction application would meet code since the duration of the activities is unknown at this time. Table 3.5-4 shows which buildings' construction noise levels exceed code at the neighboring property lines for all ~~three~~ four Build Alternatives.

Table 3.5-4 presents noise levels predicted at the closest property lines to the site. Noise is expected to decrease approximately 4 - 6 dB per doubling of distance from the noise source. For example, the noise level associated with excavation for the new garage and central utility plant in Alternative 3 (top line of Table 3.5-4) was predicted to be 85 dBA at the north property line which is approximately 80 feet away. Using the 4-6 dBA reduction per doubling of distance, the code noise level of 80 dBA is expected to be met approximately 160-200 feet away from the north side of the construction site.

Table 3.5-4
Seattle Noise Code Exceedances

Alternative	Neighboring Property Line	Building	Construction Activity	Code Level Exceeded	Level Exceeded By
Alternative 3	North	New Garage and CUP	Excavation	80 dBA	5 dB
		New Garage	Excavation	80 dBA	5 dB
		Hartmann	Demolition	80 dBA	5 dB
		Hartmann	Excavation	80 dBA	10 dB
		Hartmann	Structure	80 dBA	1 dB
	South	Hartmann	Demolition	90 dBA	2 dB
		Hartmann	Excavation	90 dBA	7 dB
		Hartmann	Structure	80 dBA	8 dB
	West	Tower 3	Demolition	80 dBA	6 dB
		Tower 3	Excavation	90 dBA	1 dB
		Tower 3	Structure	80 dBA	2 dB
		Tower 4	Demolition	80 dBA	6 dB
		Tower 4	Excavation	90 dBA	1 dB
		Tower 4	Structure	80 dBA	2 dB
Alternative 6	North	Hartmann	Demolition	90 dBA	2 dB
		Hartmann	Excavation	90 dBA	7 dB
		Hartmann	Structure	80 dBA	8 dB
		Tower 4	Excavation	80 dBA	5 dB
		New Office Space	Excavation	80 dBA	5 dB
	South	Hartmann	Demolition	90 dBA	2 dB
		Hartmann	Excavation	90 dBA	7 dB
		Hartmann	Structure	80 dBA	8 dB
		New Office Space	Excavation	80 dBA	5 dB
	East	New Garage and CUP	Excavation	80 dBA	3 dB
		Tower 3	Excavation	80 dBA	3 dB
Alternative 7R	North	Laurelon (Phase 1)	Demolition	90 dBA	2 dB
		Laurelon (Phase 1)	Excavation	90 dBA	7 dB
		Laurelon (Phase 1)	Structure	80 dBA	8 dB
		Hartmann	Demolition	90 dBA	2 dB
		Hartmann	Excavation	90 dBA	7 dB
		Hartmann	Structure	80 dBA	8 dB
		On Campus Garage (Phase 4A)~~Giraffe Garage~~	Demolition~~Excavation~~	80 dBA	1 dB~~3 dB~~
		On Campus Garage (Phase 4A)~~New Office Space~~	Excavation	80 dBA	6 dB~~5 dB~~
		On Campus Garage (Phase 4B)	Demolition	80 dBA	1 dB
		On Campus Garage (Phase 4B)	Excavation	80 dBA	6 dB

Alternative	Neighboring Property Line	Building	Construction Activity	Code Level Exceeded	Level Exceeded By
		On Campus Office (Phase 4B)	Demolition	80 dBA	6 dB
		On Campus Office (Phase 4B)	Excavation	90 dBA	1 dB
		On Campus Office (Phase 4B)	Structure	80 dBA	2 dB
	South	Hartmann	Demolition	90 dBA	2 dB
		Hartmann	Excavation	90 dBA	7 dB
		Hartmann	Structure	80 dBA	8 dB
		Laurelon Garage	Demolition	80 dBA	1 dB
		Laurelon Garage	Excavation	80 dBA	~~3~~ 10 dB
		Laurelon Garage	Structure	80 dBA	1 dB
	East	Hartmann	Demolition	90 dBA	6 dB
		Hartmann	Excavation	90 dBA	9 dB
		Hartmann	Structure	90 dBA	5 dB
		On Campus Garage (Phase 4A)	Demolition	80 dBA	1 dB
		On Campus Garage (Phase 4A)	Excavation	80 dBA	~~1~~ 6 dB
	West	Laurelon (Phase 1)	Demolition	80 dBA	10 dB
		Laurelon (Phase 1)	Excavation	90 dBA	5 dB
		Laurelon (Phase 1)	Structure	80 dBA	6 dB
		Laurelon Garage	Demolition	80 dBA	6 dB
		Laurelon Garage	Excavation	~~80~~ 90 dBA	~~5~~ 1 dB
		Laurelon Garage	Structure	80 dBA	2 dB
		Hartmann	Demolition	90 dBA	6 dB
		Hartmann	Excavation	90 dBA	8 dB
		Hartmann	Structure	90 dBA	6 dB
		Laurelon D/T Bed Tower ~~2~~	Excavation	80 dBA	~~4~~ 5 dB
		On Campus Garage (Phase 4A)	Demolition	80 dBA	1 dB
		On Campus Garage (Phase 4B)~~Tower 3~~	Excavation	80 dBA	~~5~~ 7 dB
		On Campus Office (Phase 4B)	Demolition	80 dBA	6 dB
		On Campus Office (Phase 4B)	Excavation	90 dBA	1 dB
		On Campus Office (Phase 4B)	Structure	80 dBA	2 dB
Alternative 8	North	Laurelon (Phase 1)	Demolition	90 dBA	2 dB
		Laurelon (Phase 1)	Excavation	90 dBA	7 dB
		Laurelon (Phase 1)	Structure	80 dBA	8 dB
		Office (Phase 3A)	Excavation	80 dBA	3 dB
		On Campus Garage (Phase 4A)	Demolition	80 dBA	1 dB
		On Campus Garage (Phase 4A)	Excavation	80 dBA	6 dB
		On Campus Garage (Phase 4B)	Demolition	80 dBA	1 dB

Alternative	Neighboring Property Line	Building	Construction Activity	Code Level Exceeded	Level Exceeded By
		On Campus Garage (Phase 4B)	Excavation	80 dBA	6 dB
		On Campus Office (Phase 4B)	Demolition	80 dBA	6 dB
		On Campus Office (Phase 4B)	Excavation	90 dBA	1 dB
		On Campus Office (Phase 4B)	Structure	80 dBA	2 dB
	South	Laurelon Garage	Demolition	80 dBA	1 dB
		Laurelon Garage	Excavation	80 dBA	10 dB
		Laurelon Garage	Structure	80 dBA	1 dB
	East	On Campus Garage (Phase 4A)	Demolition	80 dBA	1 dB
		On Campus Garage (Phase 4A)	Excavation	80 dBA	6 dB
	West	Laurelon (Phase 1)	Demolition	80 dBA	10 dB
		Laurelon (Phase 1)	Excavation	90 dBA	5 dB
		Laurelon (Phase 1)	Structure	80 dBA	6 dB
		Laurelon Garage	Demolition	80 dBA	6 dB
		Laurelon Garage	Excavation	90 dBA	1 dB
		Laurelon Garage	Structure	80 dBA	2 dB
		Laurelon D/T Bed Tower	Excavation	80 dBA	5 dB
		Office (Phase 3A)	Excavation	80 dBA	5 dB
		On Campus Office (Phase 4B)	Demolition	80 dBA	2 dB
		On Campus Office (Phase 4B)	Excavation	80 dBA	7 dB

Temporary Helipad Locations – Alternatives 3 and 6

During various phases of construction for either Alternative 3 or 6, emergency operations would utilize two temporary ground-based helipads within 300 feet east-northeast and northwest of the existing helipad. Each temporary helipad would be used consecutively and not concurrently.

During the construction period for the first bed unit, Children's does not expect an increase of flight operations relative to the existing condition. Therefore, the flight operations for each of the two temporary helipads are identical to the existing condition presented in Table 3.5-5.

With Alternative 7R or 8, the helipad would remain in its existing location until the first unit containing the Emergency Department is constructed. At that time, the helipad would be relocated to the top of the new building. For Alternative 7R or 8, there would be no temporary relocation of the helipad.

Table 3.5-5
Modeled Noise Levels at Temporary Helipad Location 1 for Alternatives 3 and 6

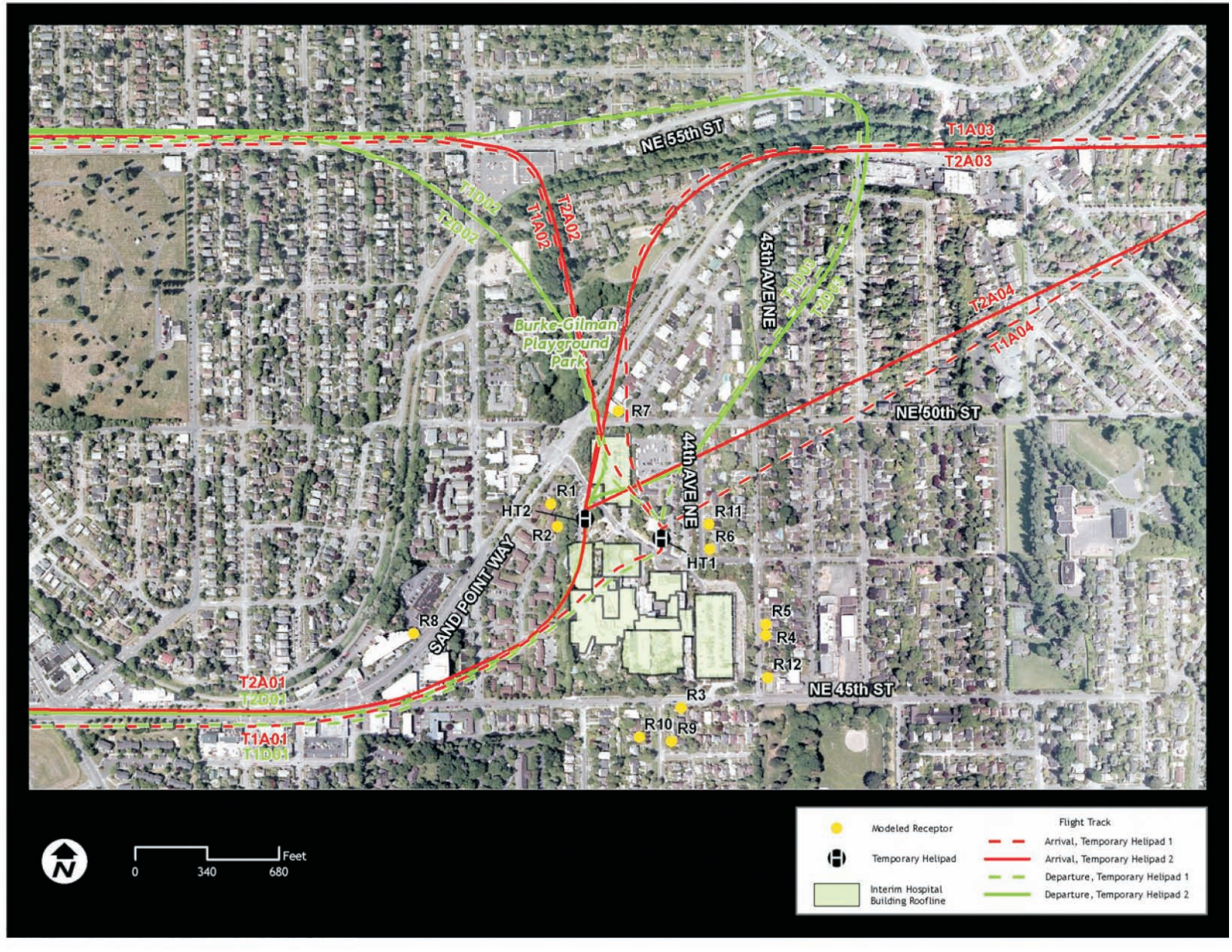
Receptor		Noise Level (dBA)				Max SEL Track	Change from Existing DNL			
ID	Address	AD[a] DNL	BD[b] DNL	Lmax	Max SEL		AD DNL	BD DNL	Lmax	Max SEL
R1	Laurelon Terrace, northernmost building	43	59	85	96	T1A02	-1	-1	0	-2
R2	Laurelon Terrace, south of R1	43	59	83	96	T1A02	-1	-1	2	-1
R3	4323 NE 45th St.	36	52	75	90	T1A01	0	0	2	1
R4	4546 45th Ave. NE	38	54	78	91	T1A06	0	0	5	-1
R5	4554 45th Ave. NE	39	55	80	94	T1A06	1	1	4	2
R6	4702 45th Ave. NE	46	62	91	101	T1A06	1	1	2	0
R7	4200 NE 50th St.	47	63	92	102	T1A02	0	0	3	0
R8	4545 Sand Point Way	40	56	86	97	T1A01	-1	-1	-1	-1
R9	4412 43rd Ave. NE	35	52	77	90	T1A01	1	0	2	0
R10	4415 43rd Ave. NE	36	52	79	92	T1A01	0	0	2	1
R11	4720-4724 44th Ave. NE	47	63	92	101	T1A06	1	1	2	0
R12	4530 45th Ave. NE	36	52	74	89	T1A06	0	-1	2	-1

[a]AD = Average Day is 3 daytime landings and 1 nighttime landing per month
[b] BD = Busiest Day is 2 daytime landings and 2 nighttime landings per day
Daytime is from 7:00 am until 10:00 pm, nighttime is from 10:00 pm until 7:00 am.
All receptor elevations are assumed to be 5 ft above ground level.

DNL = Day-Night Average Sound Level
Lmax = Maximum Sound Level
SEL = Sound Exposure Level
dBA = A-weighted decibels re 20 µPa

The first temporary helipad location for Alternatives 3 or 6, called Temporary Helipad 1, would be on the ground approximately 175 feet east-northeast of the existing helipad at an elevation of 150 feet above msl, and would be used during the construction of the new emergency department wing. The second temporary location, called Temporary Helipad 2, would be on the ground approximately 260 feet northwest of the current location, at an elevation of 105 feet above msl (see Figure 3.5-8). The second temporary location would be used after the emergency department wing was completed, during construction of the nursing tower. Each temporary helipad would be used consecutively and not concurrently. Because NOISEMAP requires helipads be modeled as runways, the each helipad was modeled as a 40-foot-long runway in a north-south orientation centered on the helipad location.

33759484_11.cdr



Source: Wyle and CHRMC, 2007

Figure 3.5-8

Modeled Flight Tracks for Temporary Helipad Locations - Alternatives 3 and 6

Tables 3.5-5 and 3.5-6 show the noise exposure values at the modeled receptors for the two temporary helipad locations. Among the 12 receptors, DNLs would range from 36 dBA to 64 dBA, Lmax would range from 72 dBA to 92 dBA, and SELs would range from 89 dBA to 102 dBA. Receptor R7 at 4200 NE 50th Street would experience the highest DNL (48 dBA for an average day and 64 dBA for a busy day for Temporary Helipad 2). Receptors R7 and R11 would experience the highest Lmax (92 dBA for Temporary Helipad 1). As indicated by the "Max SEL Track" column of Tables 3.5-5 and 3.5-6, all of the maximum SELs are due to arrival flights. For either temporary location, the maximum increase in DNL or SEL relative to the existing condition would be 3 dB or less at all 12 receptors. For Temporary Helipad 1, Lmax would not change or would decrease by 1 decibel (dB) at receptors R1 and R8, but would increase by 2 dB to 5 dB at the other 10 receptors. The minimum change in the sound level of individual events that an average human ear can detect is about 3 dB.

Table 3.5-6
Modeled Noise Levels at Temporary Helipad Location 2 for Alternative 3 or 6

Receptor		Noise Level (dBA)				Max SEL Track	Change from Existing (dBA)			
ID	Address	AD† DNL	BD‡ DNL	Lmax	Max SEL		AD† DNL	BD‡ DNL	Lmax	Max SEL
R1	Laurelon Terrace, northernmost building	47	63	89	99	A02	3	3	4	1
R2	Laurelon Terrace, south of R1	46	61	91	100	A02	2	1	10	3
R3	4323 NE 45th St.	36	51	74	89	A01	0	-1	1	0
R4	4546 45th Ave. NE	37	53	72	90	A04	-1	-1	-1	-2
R5	4554 45th Ave. NE	37	53	75	91	A04	-1	-1	-1	-1
R6	4702 45th Ave. NE	42	58	81	96	A04	-3	-3	-8	-5
R7	4200 NE 50th St.	48	64	91	102	A03	1	1	2	0
R8	4545 Sand Point Way	42	57	87	98	A01	1	0	0	0
R9	4412 43rd Ave. NE	36	51	76	90	A01	1	-1	1	0
R10	4415 43rd Ave. NE	36	52	78	91	A01	0	0	1	0
R11*	4720-4724 44th Ave. NE	44	59	84	98	A04	-2	-3	-6	-3
R12**	4530 45th Ave. NE	36	52	72	89	A04	0	-1	0	-1

[a]AD = Average Day is 3 daytime landings and 1 nighttime landing per month
[b] BD = Busiest Day is 2 daytime landings and 2 nighttime landings per day
Daytime is from 7:00 am until 10:00 pm, nighttime is from 10:00 pm until 7:00 am.
All receptor elevations are assumed to be 5 ft above ground level.

DNL = Day-Night Average Sound Level
Lmax = Maximum Sound Level
SEL = Sound Exposure Level
dBA = A-weighted decibels re 20 µPa

Temporary Helipad 1 is closer to the eastern edge of the Children's property than the existing helipad location, so aircraft would be earlier in their initial ascent and therefore at a lower

altitude when flying past receptors north and east of the hospital. The aircraft also would be a shorter horizontal distance from receptors such as R6 and R11. The building would provide less shielding between Temporary Helipad 1 and receptors east of the hospital than it does for the existing helipad.

For Temporary Helipad 2, Lmax would not change or would decrease relative to the existing condition by 1 to 8 dB at receptors R4, R5, R6, R8, R11, and R12. Lmax would increase by 1 to 10 dB at the other six receptors. In this case, Temporary Helipad 2 is closer to the western edge of the Children's property, so aircraft passing western receptors such as R1 and R2 would be horizontally closer to the receptors and flying lower than in the existing case. Comparing the change in Lmax at R1 and R2 illustrates the effect of topography on noise exposure. R2 is closer to the embankment at the western edge of the Children's property, and the line of sight between the existing helipad and R2 is interrupted by the embankment and the northwest wing of the hospital. The closer location of Temporary Helipad 2 decreases the shielding effect, and the steep altitude profile of tracks T2A01 and T2D01 contribute to a greater increase relative to the existing condition. Receptors south and east of the hospital would experience the least increase in Lmax (in some cases, the Lmax would decrease), due to building shielding and greater distance from the flight tracks.

3.5.2.2 Operation

Hospital Operation

As with the existing conditions, the primary sources of outdoor noise at the existing hospital would continue to be the ventilation for heating and cooling systems, traffic, and helicopter landings and takeoffs. With all of the action alternatives the central utility plant would be replaced with new state-of-the art equipment and the equipment dispersed throughout the site and incorporated into the new building designs.

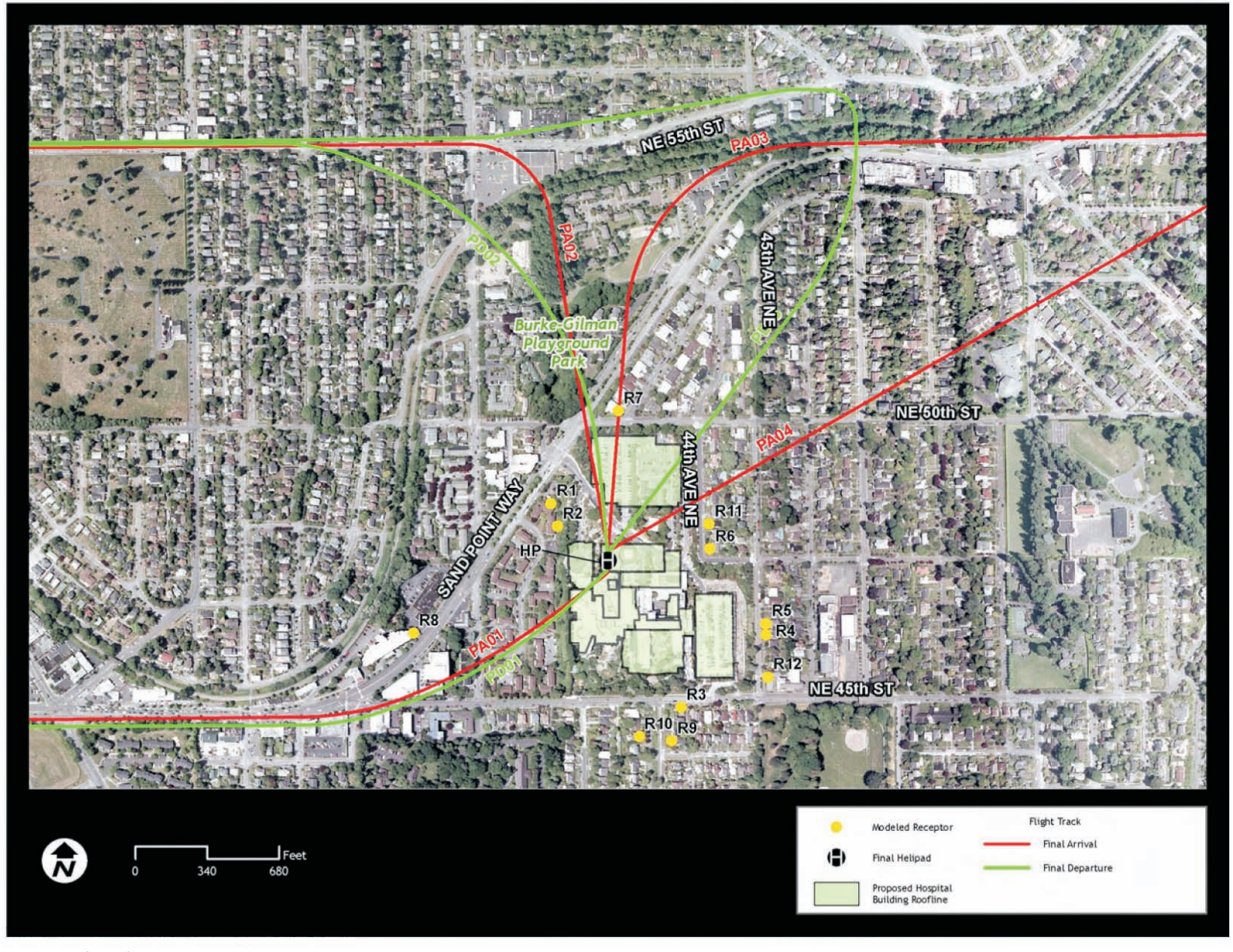
Operation of Mechanical Equipment

The addition of the building equipment is expected to impact the ambient noise on the campus. Under the proposed action, the building equipment used for heating, refrigeration, air conditioning, ventilation, medical support and power generation, among other noise generating equipment would be designed to be quieter than the maximum permissible noise levels as set forth by the City of Seattle Noise Ordinance in Table 3.5-3. The Ordinance limits the noise received at the nearest residential property to 55 dBA during daytime hours and 45 dBA during the nighttime hours. Children's has ~~stated that they plan to perform ongoing~~initiated quarterly noise monitoring around the perimeter of Children's campus to identify noise issues and take steps to reduce the noise before the noise becomes disturbing to neighbors.

Operation of Helipad for Alternative 3

In the proposed final or permanent location for Alternative 3, the helipad would be relocated to the roof of the proposed nursing tower at an elevation of 270 feet above msl, approximately 105 feet southwest of the existing helipad. See Figure 3.5-9 for modeled flight tracks for the proposed helipad location.

33759484_12.cdr



Source: Wyle and CHRMC, 2007

Figure 3.5-9

Modeled Flight Tracks for Proposed Helipad Location - Alternative 3

Table 3.5-7 lists the noise exposure values for the modeled receptors for the Alternative 3 helipad location. Among the 12 receptors, DNLs would range from 37 dBA to 62 dBA, Lmax would range from 74 dBA to 88 dBA, and SELs would range from 90 dBA to 101 dBA. Receptor R7 at 4200 NE 50th Street would experience the highest DNLs (47 dBA for an average day and 62 dBA for a busy day) and the highest Lmax (88 dBA). As indicated by the "Max SEL Track" column, all of the maximum SELs would be due to arrival flights.

Table 3.5-7
Modeled Noise Levels at Proposed Helipad Location for Alternative 3

Receptor		Noise Level (dBA)				Max SEL Track	Change from Existing (dBA)			
ID	Address	AD† DNL	BD‡ DNL	Lmax	Max SEL		AD† DNL	BD‡ DNL	Lmax	Max SEL
R1	Laurelon Terrace, northernmost building	45	60	82	98	PA2	1	0	-3	0
R2	Laurelon Terrace, south of R1	45	60	81	97	PA 2	1	0	0	0
R3	4323 NE 45th St.	37	52	78	91	PA 1	2	0	5	2
R4	4546 45th Ave. NE	39	54	75	92	PA 4	1	0	2	0
R5	4554 45th Ave. NE	39	54	75	92	PA 4	1	0	-1	0
R6	4702 45th Ave. NE	44	59	82	99	PA 4	-1	-2	-7	-2
R7	4200 NE 50th St.	47	62	88	100	PA 3	0	-1	-1	-2
R8	4545 Sand Point Way	41	56	85	97	PA 1	0	-1	-2	-1
R9	4412 43rd Ave. NE	37	52	77	90	PA 1	2	0	2	0
R10	4415 43rd Ave. NE	37	52	79	91	PA 1	1	0	2	0
R11*	4720-4724 44th Ave. NE	46	61	87	101	PA 4	0	-1	-3	0
R12**	4530 45th Ave. NE	38	53	74	90	PA 4	2	0	2	0

* Receptor Location 1 from 1991 FEIS
** Receptor Location 2 from 1991 FEIS
[a]AD = Average Day is 3 daytime landings and 1 nighttime landing per month
[b] BD = Busiest Day is 2 daytime landings and 2 nighttime landings per day
Daytime is from 7:00 am until 10:00 pm, nighttime is from 10:00 pm until 7:00 am.
All receptor elevations are assumed to be 5 ft above ground level.

DNL = Day-Night Average Sound Level
Lmax = Maximum Sound Level
SEL = Sound Exposure Level
dBA = A-weighted decibels re 20 µPa

The increase in DNL or SEL relative to the existing condition would be 2 dB or less at all 12 receptors. Due to the decreased building shielding, the increase in Lmax would be between 2 and 5 dB at receptors R3, R4, R9, R10 and R12. Receptor R2 would experience no change in Lmax, and receptors R1 and R12 would experience no change in Lmax. Lmax would decrease by 1 to 7 dB at receptors R1, R5 through R8, and R11. Because the proposed helipad is approximately 140 feet higher than the existing pad, aircraft that overfly receptors would do so at a higher altitude, decreasing their noise exposure. If the helipad location were not moved (and

no construction occurred), DNL would increase by 1 dB solely due to the increase in average daily flight operations relative to the existing conditions.

Operation of Helipad for Alternative 6

In the proposed final or permanent location for Alternative 6, the helipad would be relocated to the roof of the proposed nursing tower at an elevation of 266 feet above msl, approximately 80 feet southwest of the existing helipad. See Figure 3.5-10 for modeled flight tracks for the proposed helipad location.

Table 3.5-8 lists the noise exposure values for the modeled receptors for the Alternative 6 helipad location. Among the 12 receptors, DNLs would range from 36 dBA to 62 dBA, Lmax would range from 72 dBA to 91 dBA, and SELs would range from 90 dBA to 101 dBA. Receptor R7 at 4200 NE 50th Street would experience the highest DNLs (47 dBA for an average day and 62 dBA for a busy day). Receptor R11 at 4720-4724 44th Avenue NE would experience the highest Lmax (91 dBA). As indicated by the "Max SEL Track" column, all of the maximum SELs would be due to arrival flights.

33759484_148.cdr

Source: Wyle and CHRMC, 2007

Figure 3.5-10

Modeled Flight Tracks for Proposed Helipad Location - Alternative 6

Table 3.5-8
Modeled Noise Levels at Proposed Helipad Location for Alternative 6

Receptor		Noise Level (dBA)				Max SEL Track	Change from Existing (dBA)			
ID	Address	AD† DNL	BD‡ DNL	Lmax	Max SEL		AD† DNL	BD‡ DNL	Lmax	Max SEL
R1	Laurelon Terrace, northernmost building	45	60	84	97	A02	1	0	-1	-1
R2	Laurelon Terrace, south of R1	45	60	81	97	A02	1	0	0	0
R3	4323 NE 45th St.	37	52	77	91	A01	1	0	4	2
R4	4546 45th Ave. NE	39	54	75	92	A04	1	0	2	0
R5	4554 45th Ave. NE	39	54	75	92	A04	1	0	-1	0
R6	4702 45th Ave. NE	44	59	82	99	A04	-1	-2	-7	-2
R7	4200 NE 50th St.	47	62	85	100	A03	0	-1	-4	-2
R8	4545 Sand Point Way	41	56	85	97	A01	0	-1	-2	-1
R9	4412 43rd Ave. NE	36	51	76	90	A01	1	-1	1	0
R10	4415 43rd Ave. NE	37	52	78	91	A01	1	0	1	0
R11*	4720-4724 44th Ave. NE	46	61	91	101	A04	0	-1	1	0
R12**	4530 45th Ave. NE	37	52	72	90	A04	1	-1	0	0

* Receptor Location 1 from 1991 FEIS
** Receptor Location 2 from 1991 FEIS
[a]AD = Average Day is 3 daytime landings and 1 nighttime landing per month
[b] BD = Busiest Day is 2 daytime landings and 2 nighttime landings per day
Daytime is from 7:00 am until 10:00 pm, nighttime is from 10:00 pm until 7:00 am.
All receptor elevations are assumed to be 5 ft above ground level.

DNL = Day-Night Average Sound Level
Lmax = Maximum Sound Level
SEL = Sound Exposure Level
dBA = A-weighted decibels re 20 µPa

The increase in DNL or SEL relative to the existing condition would be 2 dB or less at all 12 receptors. Due to the decreased building shielding, the increase in Lmax would be between 1 and 4 dB at receptors R3, R4, R9, and R10. This increase is greatest for R3, which experiences the most building shielding of the receptors in the existing condition. Receptor R11 would experience a 1 dB increase in Lmax, and receptors R2 and R12 would experience no change in Lmax. Lmax would decrease by 1 to 7 dB at receptor R1 and receptors R5 through R8. Because the proposed helipad is approximately 135 feet higher than the existing pad, aircraft that overfly receptors would do so at a higher altitude, decreasing their noise exposure.

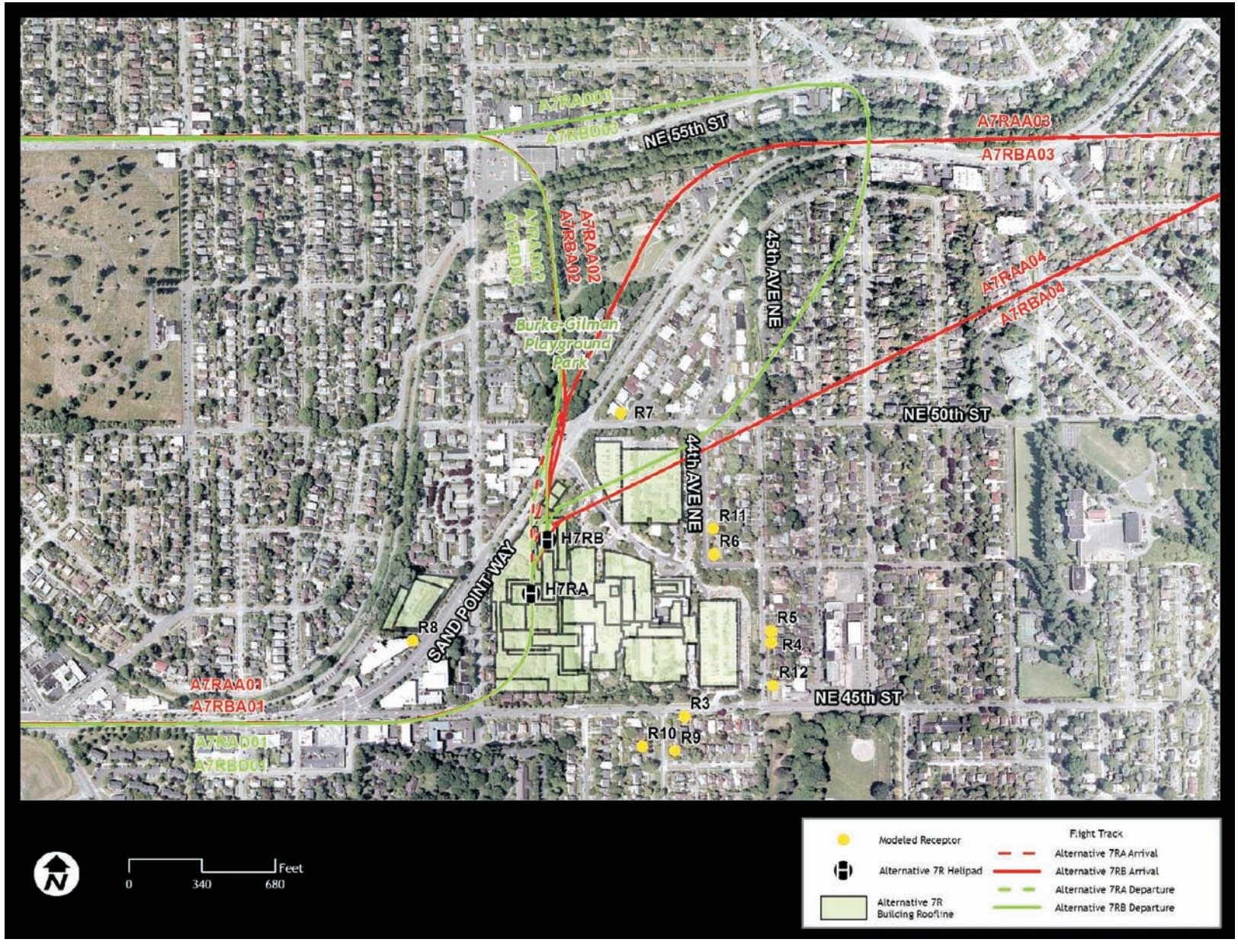
Operation of Helipad for Alternative 7R

There would be no temporary helipad location for Alternative 7R. The helipad would remain in its existing location until the first phase of Alternative 7R is constructed on the existing Laurelon Terrace site. The first phase would include a new location for the Emergency Department. At

that time the helipad would be relocated to the top of the new building placing it closer to Sand Point Way NE. There are two options being considered for the location of the Emergency Department. The helipad would be placed on the top of the building that is selected for the Emergency Department. One location analyzed for noise levels is depicted as Alternative 7RA Helipad Location, which would be located on the ~~north~~ roof of the center building on the Laurelon Terrace site. The second location is called Alternative 7RB Helipad Location and would be located on the roof of the northernmost building ~~in the central portion of~~on the Laurelon Terrace site. See revised Figure 3.5-11 for modeled flight tracks for the proposed helipad location for Alternative 7R.

Table 3.5-9 lists the noise exposure values for the modeled receptors for the Alternative 7RA helipad location (on top of the north building on the Laurelon Terrace site). Exposure calculations were not performed for receptors R1 and R2 because they would be on Children's property under Alternative 7R. Among the 10 analyzed receptors, DNLs would range from 37 dBA to 61 dBA, Lmax would range from 75 dBA to 87 dBA, and SELs would range from 89 dBA to 98 dBA. Receptor R7 would experience the highest DNLs (46 dBA for an average day and 61 dBA for a busy day) and the highest Lmax (87 dBA). As indicated by the "Max SEL Track" column, all of the maximum SELs would be due to arrival flights.

33759484_165.cdr



Source: Wyle Laboratories, Inc.

Figure 3.5-11 rev

Modeled Flight Tracks for Alternatives 7RA and 7RB Helipad Locations

Table 3.5-9
Noise Exposure from Emergency Operations at Alternative 7RA Helipad Location

Receptor		Noise Level (dBA)				Max SEL Track	Change from Existing (dBA)			
ID	Address	AD† DNL	BD‡ DNL	Lmax	Max SEL		AD† DNL	BD‡ DNL	Lmax	Max SEL
R1	n/a***	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
R2	n/a***	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
R3	4323 NE 45th St.	~~37~~36	52	~~77~~75	~~90~~89	A01	~~1~~0	0	~~4~~2	~~1~~0
R4	4546 45th Ave. NE	38	53	77	90	A04	0	-1	4	-2
R5	4554 45th Ave. NE	38	53	77	91	A04	0	-1	1	-1
R6	4702 45th Ave. NE	42	57	84	96	A04	-3	-4	-5	-5
R7	4200 NE 50th St.	46	61	87	98	A03	-1	-2	-2	-4
R8	4545 Sand Point Way	~~41~~42	~~57~~58	~~85~~86	97	A01	~~0~~1	~~0~~1	~~-2~~ -1	-1
R9	4412 43rd Ave. NE	37	~~52~~53	~~77~~76	~~90~~89	A01	2	~~0~~1	~~2~~1	~~0~~ -1
R10	4415 43rd Ave. NE	38	53	~~79~~77	~~92~~90	A01	2	1	~~2~~0	-1
R11*	4720-4724 44th Ave. NE	43	58	86	97	A04	-3	-4	-4	-4
R12**	4530 45th Ave. NE	37	52	75	89	A04	1	-1	3	-1

* Receptor Location 1 from 1991 FEIS
** Receptor Location 2 from 1991 FEIS
[a]AD = Average Day is 3 daytime landings and 1 nighttime landing per month
[b] BD = Busiest Day is 2 daytime landings and 2 nighttime landings per day
Daytime is from 7:00 am until 10:00 pm, nighttime is from 10:00 pm until 7:00 am.
All receptor elevations are assumed to be 5 ft above ground level.

DNL = Day-Night Average Sound Level
Lmax = Maximum Sound Level
SEL = Sound Exposure Level
dBA = A-weighted decibels re 20 µPa

The increase in DNL or SEL relative to the existing condition would be 2 dB or less at all 10 receptors with many receptors experiencing a decrease. Due to the decreased building shielding, the increase in Lmax would be ~~between 1 and~~up to 4 dB at receptors R3 through R5, R9, ~~R10,~~ and R12. ~~This increase is greatest for R3 and R4 which experience the most building shielding of the receptors in the existing condition.~~ Lmax would decrease by ~~2~~ 1 to 5 dB at receptors R6 through R8, and R11. R10 would experience no measurable change in Lmax. Because the proposed helipad is approximately ~~70~~ 40 feet higher than the existing pad, aircraft that overfly receptors would do so at a higher altitude, decreasing their noise exposure. In addition, the westward shift of the helipad would shift the flight tracks farther away from R6, R7, and R11. If the helipad location were not moved (and no construction occurred), DNL would increase by 1 dB solely due to the increase in average daily flight operations relative to the existing conditions.

Table 3.5-10 lists the noise exposure values for the modeled receptors for the Alternative 7RB helipad location (the ~~central~~ northern building location). Exposure calculations were not

performed for receptors R1 and R2 because they would be on Children's property under Alternative 7R. Among the 10 analyzed receptors, DNLs would range from 37 dBA to ~~60~~ 61 dBA, Lmax would range from 75 dBA to ~~90~~ 87 dBA, and SELs would range from ~~90~~ 89 dBA to ~~100~~ 98 dBA. Receptor~~s~~ R7 ~~and R11~~ would experience the highest DNLs (~~45~~ 46 dBA for an average day and ~~60~~ 61 dBA for a busy day) and the highest Lmax (87 dBA). ~~Receptor R11 would experience the highest Lmax (90 dBA).~~ As indicated by the "Max SEL Track" column, all of the maximum SELs would be due to arrival flights.

Table 3.5-10
Noise Exposure from Emergency Operations at Alternative 7RB Helipad Location

Receptor		Noise Level (dBA)				Max SEL Track	Change from Existing (dBA)			
ID	Address	AD† DNL	BD‡ DNL	Lmax	Max SEL		AD† DNL	BD‡ DNL	Lmax	Max SEL
R1	n/a***	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
R2	n/a***	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
R3	4323 NE 45th St.	~~38~~37	~~53~~52	~~75~~76	90	A01	1	~~1~~0	~~-3~~3	~~-1~~1
R4	4546 45th Ave. NE	~~39~~37	~~54~~53	~~79~~77	~~92~~90	A04	~~0~~-1	~~0~~-1	4	~~0~~-2
R5	4554 45th Ave. NE	~~39~~38	~~54~~53	~~80~~77	~~93~~91	A04	0	~~0~~-1	~~5~~1	~~1~~-1
R6	4702 45th Ave. NE	~~44~~42	~~59~~57	~~88~~84	~~98~~96	A04	~~0~~-3	~~0~~-4	~~6~~-5	~~-1~~-5
R7	4200 NE 50th St.	~~45~~46	~~60~~61	87	98	A03	~~-2~~1	-2	~~-1~~-2	~~-2~~-4
R8	4545 Sand Point Way	42	57	~~85~~86	97	A01	1	~~1~~0	~~0~~-1	~~0~~-1
R9	4412 43rd Ave. NE	~~38~~37	~~53~~52	76	90	A01	~~1~~2	~~1~~0	~~-1~~1	0
R10	4415 43rd Ave. NE	~~39~~38	~~54~~53	78	91	A01	2	~~2~~1	~~-1~~1	0
R11*	4720-4724 44th Ave. NE	~~45~~43	~~60~~58	~~90~~86	~~100~~97	A04	~~-1~~.-3	~~-1~~-4	~~3~~-4	~~-1~~-4
R12**	4530 45th Ave. NE	37	~~53~~52	75	~~90~~89	A04	~~-1~~1	~~0~~-1	~~1~~3	~~0~~-1

* Receptor Location 1 from 1991 FEIS
** Receptor Location 2 from 1991 FEIS
[a]AD = Average Day is 3 daytime landings and 1 nighttime landing per month
[b] BD = Busiest Day is 2 daytime landings and 2 nighttime landings per day
Daytime is from 7:00 am until 10:00 pm, nighttime is from 10:00 pm until 7:00 am.
All receptor elevations are assumed to be 5 ft above ground level.

DNL = Day-Night Average Sound Level
Lmax = Maximum Sound Level
SEL = Sound Exposure Level
dBA = A-weighted decibels re 20 µPa

At Alternative 7RB Helipad Location, the increase in DNL or SEL relative to the existing condition would be 2 dB or less at ~~8 of the~~all 10 receptors with many receptors experiencing a decrease. Due to the decreased building shielding, the increase in Lmax would be between 1 and ~~6~~ 4 dB at receptors R3 through R5, R9, R10, and R12. This increase is greatest for ~~R3~~R4, which experiences the most building shielding of the receptors in the existing condition. Lmax would decrease ~~up to~~by 2 to 5 dB at receptors R6 through R8, and R11 ~~would stay the same~~. Because the proposed helipad is approximately 50 feet higher than the existing pad, aircraft that overfly

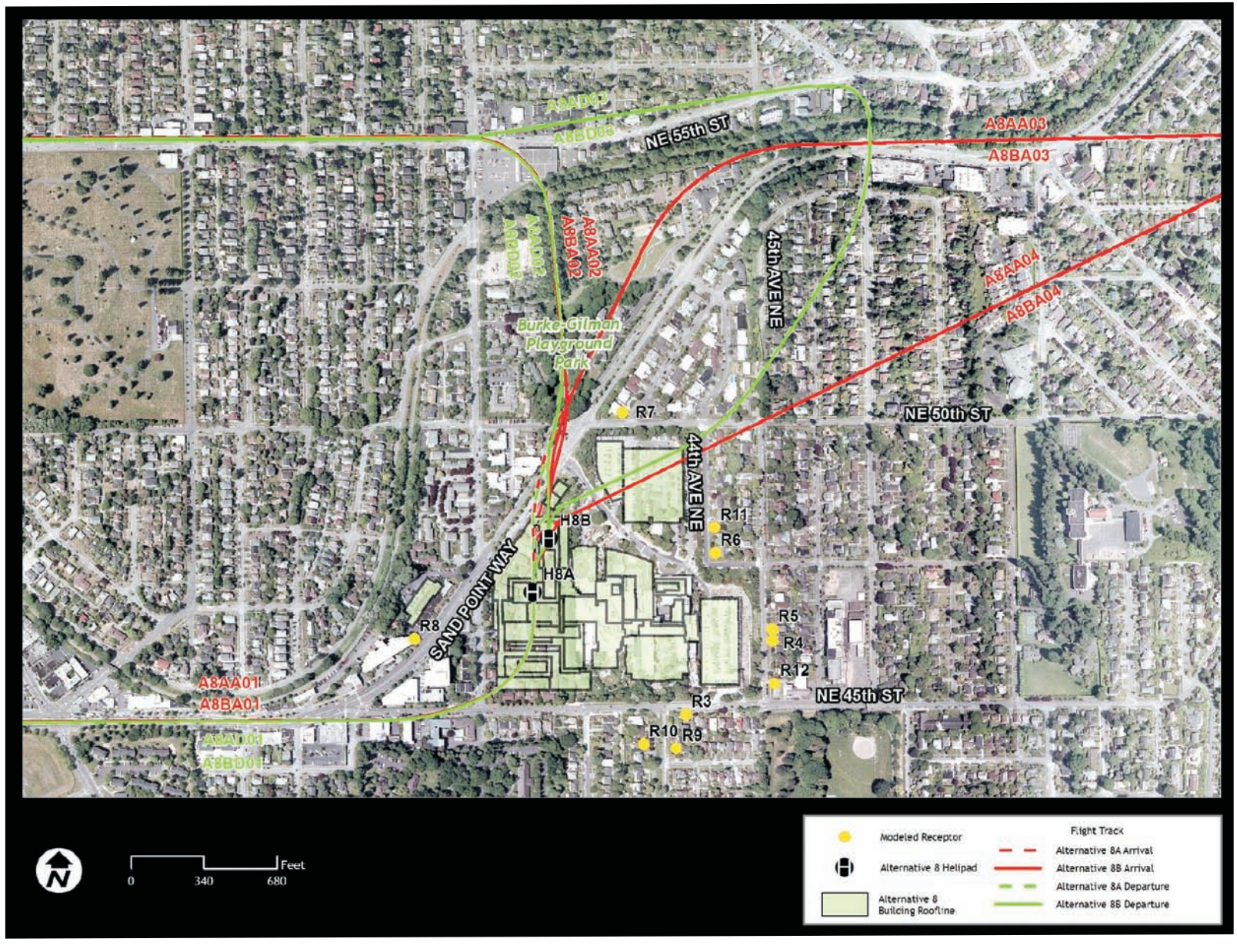
receptors would do so at a higher altitude, decreasing their noise exposure. In addition, the westward shift of the helipad would shift the flight tracks farther away from R6, R7, and R11. If the helipad location were not moved (and no construction occurred), DNL would increase by 1 dB solely due to the increase in average daily flight operations relative to the existing conditions.

Operation of Helipad for Alternative 8

There would be no temporary helipad location for Alternative 8. The helipad would remain in its existing location until the first phase of Alternative 8 is constructed on the existing Laurelon Terrace site. The first phase would include a new location for the Emergency Department. At that time the helipad would be relocated to the top of the new building placing it closer to Sand Point Way NE. There are two options being considered for the location of the Emergency Department. The helipad would be placed on the top of the building that is selected for the Emergency Department. One location analyzed for noise levels is depicted as Alternative 8A Helipad Location, which would be located on the roof of the center building on the Laurelon Terrace site, approximately 450 ft southward of the existing helipad and at an elevation of 167 MSL. The second location is called Alternative 8B Helipad Location and would be located on the roof of the northernmost building of the Laurelon Terrace site. See Figure 3.5-12 for modeled flight tracks for the proposed helipad location for Alternative 8.

Table 3.5-11 lists the noise exposure values for the modeled receptors for the Alternative 8A helipad location (on top of the center building on the Laurelon Terrace site). Exposure calculations were not performed for receptors R1 and R2 because they would be on Children's property under Alternative 7R. Among the 10 analyzed receptors, DNLs would range from 37 dBA to 61 dBA, Lmax would range from 75 dBA to 87 dBA, and SELs would range from 89 dBA to 98 dBA. Receptor R7 would experience the highest DNLs (46 dBA for an average day and 61 dBA for a busy day) and the highest Lmax (87 dBA). As indicated by the "Max SEL Track" column, all of the maximum SELs would be due to arrival flights because the August A109 helicopter is up to 4 dB louder on approach power than departure power.

33759484_166.cdr



Source: Wyle Laboratories, Inc.

Figure 3.5-12

Modeled Flight Tracks for Alternatives 8A and 8B Helipad Locations

Table 3.5-11
Noise Exposure from Emergency Operations at Alternative 8A Helipad Location

Receptor		Noise Level (dBA)				Max SEL Track	Change from Existing (dBA)			
ID	Address	AD† DNL	BD‡ DNL	Lmax	Max SEL		AD† DNL	BD‡ DNL	Lmax	Max SEL
R1	n/a***	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
R2	n/a***	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
R3	4323 NE 45th St.	37	52	76	89	A01	1	0	3	0
R4	4546 45th Ave. NE	38	53	77	90	A04	0	-1	4	-2
R5	4554 45th Ave. NE	38	53	77	91	A04	0	-1	1	-1
R6	4702 45th Ave. NE	42	57	84	96	A04	-3	-4	-5	-5
R7	4200 NE 50th St.	46	61	87	98	A03	-1	-2	-2	-4
R8	4545 Sand Point Way	43	58	86	97	A01	2	1	-1	-1
R9	4412 43rd Ave. NE	37	53	76	89	A01	2	1	1	-1
R10	4415 43rd Ave. NE	38	53	77	90	A01	2	1	0	-1
R11*	4720-4724 44th Ave. NE	43	58	86	97	A04	-3	-4	-4	-4
R12**	4530 45th Ave. NE	37	52	75	89	A04	1	-1	3	-1

* Receptor Location 1 from 1991 FEIS
** Receptor Location 2 from 1991 FEIS
[a]AD = Average Day is 3 daytime landings and 1 nighttime landing per month
[b] BD = Busiest Day is 2 daytime landings and 2 nighttime landings per day
Daytime is from 7:00 am until 10:00 pm, nighttime is from 10:00 pm until 7:00 am.
All receptor elevations are assumed to be 5 ft above ground level.
DNL = Day-Night Average Sound Level
Lmax = Maximum Sound Level
SEL = Sound Exposure Level
dBA = A-weighted decibels re 20 µPa

The increase in DNL or SEL relative to the existing condition would be 2 dB or less at all 10 receptors with many receptors experiencing a decrease. Due to the decreased building shielding, the increase in Lmax would be up to 4 dB at receptors R3 through R5, R9, and R12. Lmax would decrease by 1 to 5 dB at receptors R6 through R8, and R11. R10 would experience no measurable change in Lmax. Because the proposed helipad is approximately 40 feet higher than the existing pad, aircraft that overfly receptors would do so at a higher altitude, decreasing their noise exposure. In addition, the westward shift of the helipad would shift the flight tracks farther away from R6, R7, and R11. If the helipad location were not moved (and no construction occurred), DNL would increase by 1 dB solely due to the increase in average daily flight operations relative to the existing conditions.

Table 3.5-12 lists the noise exposure values for the modeled receptors for the Alternative 8B helipad location (the north building location). Exposure calculations were not performed for receptors R1 and R2 because they would be on Children's property under Alternative 8. Among

the 10 analyzed receptors, DNLs would range from 37 dBA to 61 dBA, Lmax would range from 75 dBA to 87 dBA, and SELs would range from 89 dBA to 98 dBA. Receptor R7 would experience the highest DNLs (46 dBA for an average day and 61 dBA for a busy day) and the highest Lmax (87 dBA). As indicated by the "Max SEL Track" column, all of the maximum SELs would be due to arrival flights.

Table 3.5-12
Noise Exposure from Emergency Operations at Alternative 8B Helipad Location

Receptor		Noise Level (dBA)				Max SEL Track	Change from Existing (dBA)			
ID	Address	AD† DNL	BD‡ DNL	Lmax	Max SEL		AD† DNL	BD‡ DNL	Lmax	Max SEL
R1	n/a***	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
R2	n/a***	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
R3	4323 NE 45th St.	37	52	76	90	A01	1	0	3	1
R4	4546 45th Ave. NE	38	53	77	90	A04	0	-1	4	-2
R5	4554 45th Ave. NE	38	53	77	91	A04	0	-1	1	-1
R6	4702 45th Ave. NE	42	57	84	96	A04	-3	-4	-5	-5
R7	4200 NE 50th St.	46	61	87	98	A03	-1	-2	-2	-4
R8	4545 Sand Point Way	42	57	86	97	A01	1	0	-1	-1
R9	4412 43rd Ave. NE	37	52	76	90	A01	2	0	1	0
R10	4415 43rd Ave. NE	38	53	78	91	A01	2	1	1	0
R11*	4720-4724 44th Ave. NE	43	58	86	97	A04	.-3	-4	-4	-4
R12**	4530 45th Ave. NE	37	52	75	89	A04	1	-1	3	-1

* Receptor Location 1 from 1991 FEIS
** Receptor Location 2 from 1991 FEIS
[a]AD = Average Day is 3 daytime landings and 1 nighttime landing per month
[b] BD = Busiest Day is 2 daytime landings and 2 nighttime landings per day
Daytime is from 7:00 am until 10:00 pm, nighttime is from 10:00 pm until 7:00 am.
All receptor elevations are assumed to be 5 ft above ground level.
DNL = Day-Night Average Sound Level
Lmax = Maximum Sound Level
SEL = Sound Exposure Level
dBA = A-weighted decibels re 20 µPa

At Alternative 8B Helipad Location, the increase in DNL or SEL relative to the existing condition would be 2 dB or less at all 10 receptors with many receptors experiencing a decrease. Due to the decreased building shielding, the increase in Lmax would be between 1 and 4 dB at receptors R3 through R5, R9, R10, and R12. This increase is greatest for R4, which experiences the most building shielding of the receptors in the existing condition. Lmax would decrease by 2 to 5 dB at receptors R6 through R8, and R11. Because the proposed helipad is approximately 50 feet higher than the existing pad, aircraft that overfly receptors would do so at a higher altitude, decreasing their noise exposure. In addition, the westward shift of the helipad would shift the flight tracks farther away from R6, R7, and R11. If the helipad location were not moved (and no

construction occurred), DNL would increase by 1 dB solely due to the increase in average daily flight operations relative to the existing conditions.

3.5.3 Mitigation Measures

3.5.3.1 Construction

- Construction would occur primarily during non-holiday weekdays between 7:00 am and 6:00 pm.
- Contractors would be required to minimize construction noise and vibration impacts by shielding noisy equipment, limiting equipment idling, locating noisy equipment away from property boundaries, and providing adequate mufflers.
- Nearby residents would be kept informed of upcoming construction activities that could be potentially loud. Particularly noisy construction activities would be scheduled to avoid neighborhood conflicts whenever possible.
- Where feasible, temporary walls, acoustical screens or enclosures would be used around equipment.
- To the extent possible, construction truck traffic would be rerouted away from residential areas.
- Noisy equipment would be located on site as far away from noise sensitive receivers as possible.
- Noisy operations would be combined in the same time period. The overall noise produced would not be significantly higher than the levels produced by the individual operations, however the duration could be reduced.
- Where feasible, concrete would be mixed off site and prefabricated building components used.
- Unnecessary idling equipment would be turned off.
- Electric power would be used rather than diesel equipment where possible.
- Impact pile driving would be avoided. Drilled piles or the use of a sonic vibratory pile driver are quieter alternatives.
- Specially quieted equipment would be used, such as quieted and enclosed air compressors and power generators.
- Efficient mufflers would be used on all engines.
- Quieter demolition methods would be selected where possible. For example, sawing slabs into sections that can be loaded onto trucks is a quieter process than demolition by pavement breakers.
- Portable pneumatic drills and pavement breakers would be equipped with exhaust mufflers when possible.

3.5.3.2 Operation

- Operation noise would comply with the requirements of the Seattle Municipal Code (SMC) Chapter 25.08 Noise Control.
- Designs for all noise generating equipment for all buildings, including the central plant, would be prepared to ensure compliance with SMC Chapter 25.08.
- Acoustic barriers and other noise control measures would be used to control rooftop equipment noise.
- New state-of-the art ventilation equipment oriented to the interior of the campus would be used to reduce noise levels.
- New ventilation equipment would be dispersed throughout the site and incorporated into the new building designs.
- Children's will perform on-going noise monitoring to identify and remediate noise issues before the noise levels become problematic for neighboring residents.
- Children's will establish and publicize a "noise hot line" for neighbors to report noise complaints with contact information for both non-emergency noise complaints, and after-hour emergency noise violations such as car alarms. Emergency complaints should be called into the hospital security staff.
- Helicopter flights are only used when the time saved in transporting an ill child would make a critical difference in the child's care and recovery. Mitigation measures were established in Seattle City Council's conditional use permit for the existing helipad.

3.5.4 Significant Unavoidable Adverse Impacts

Even with the mitigation measures identified above, construction noise would result in intermittent significant unavoidable adverse impacts during period of noisy construction activities (demolition, excavation, and structure erection).

3.5.5 Secondary and Cumulative Impacts

Secondary and cumulative noise impacts would occur during construction from the addition of construction traffic to area roadways. The percentage of new trips would likely be small relative to overall traffic levels on area roadways.

3.6 Hazardous Materials

3.6.1 Affected Environment

3.6.1.1 Flammable or Hazardous Chemicals

Children's has flammable liquids on site in the form of diesel emergency generators. These generators are used only in the case of emergencies and required testing, and precautions are taken to ensure there is no risk of explosion during operations or maintenance. Selected hazardous chemicals used by Children's also may be flammable.

Hazardous chemicals are generated primarily by the laboratories. Children's follows a program to minimize and recycle chemicals used in order to reduce the volume to be disposed of. From October 2006 to September 2007, 50 tons of hazardous materials were disposed of. Children's is registered with the EPA as a hazardous waste producer; its Site Identification number is WAD048682157. The following chemicals have been generated and disposed of: methyl alcohol, acetone, ethanol, ethyl acetate, phenol, dimenthyl aniline, nitrosoquanidine, benzoyl peroxide, picric acid, sodium sulfide, spent non-halogenated solvents, corrosive solid and liquid, and polyethylene glycol.

Children's follows a Chemical Hazard Communication Program in compliance with the Hazard Communication Standard, Washington Administrative Code (WAC) 296-62-054 through 296-62-05427. The program was developed by Children's Chemical Safety Task Force.

3.6.1.2 Radioactive Waste

Children's June 2006 Radiation Safety Procedure Manual details radioactive waste disposal procedures for nuclear medicine. The program is consistent with regulatory requirements (WAC 402-12-080, 402-24-170). Children's is licensed to use radioactive material by the Washington State Department of Health. Radioactive materials are used for medicines, treatment, and x-rays.

3.6.2 Impacts

3.6.2.1 Construction

During construction, diesel fuel would be brought to the site occasionally by a mobile fuel service for refueling mechanical equipment. No diesel fuel would be stored on site. Acetylene, a fuel used for welding, would be used mainly during the steel erection phase of construction. Limited amounts of acetylene would be allowed on site in the form of bottles during this phase. There would be a potential for fuel spills during refueling of construction equipment; this would be a minor impact.

3.6.2.2 Operation

Alternative 1

Alternative 1 is anticipated to result in a slight increase in the amount of hazardous materials and radioactive waste due to build out of the existing master plan and any increase in the number of patients that would be treated; this would be a minor impact.

Alternatives 3, 6, ~~and~~ 7R and 8

All of the build alternatives could have a slightly increased risk of upset compared to existing conditions due to an increase in the number of emergency diesel generators. Precautionary measures already in place would keep the risk to a minimum.

The build alternatives would result in an increase in the amount of hazardous materials and radioactive waste due to the increase in number of patients that would be treated. However, no adverse impact is anticipated, as usage and disposal of these materials would continue to be strictly regulated.

3.6.3 Mitigation Measures

During both construction and operation:

- Children's would follow all applicable safety measures to minimize potential upset.
- Children's would continue to update and follow their Chemical Hazard Communication Program and Radiation Safety Procedure Manual according to state and federal standards.
- Safeguards consistent with all applicable requirements would be taken to avoid hazards related to the handling, disposal, and transport of hazardous or radioactive materials.

3.6.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts would be expected.

3.6.5 Secondary and Cumulative Impacts

No secondary or cumulative impacts would be expected.

3.7 Land Use

3.7.1 Affected Environment

3.7.1.1 Land Use

Hospital Campus

Children's is located on a 21.7-acre site ~~within~~ adjacent to the Laurelhurst and Bryant neighborhoods in northeast Seattle. The property is wholly owned by Children's and is 0.5 mile from the Ravenna portion of the University Community Urban Center. The hospital moved from Queen Anne Hill to the current location in 1953.

The existing Major Institution boundaries are NE 50th Street to the north, 44th Avenue NE, NE 47th Street and 45th Avenue NE to the east, NE 45th Street to the south, and Sand Point Way NE and a shared property line with the Laurelon Terrace Condominiums to the west. The campus extends roughly 1,300 feet in a north-south direction and 900 feet in an east-west direction. There are approximately 900,000 sf of hospital uses and 1,462 on-site parking spaces.

There is one primary vehicle entrance to the campus from Sand Point Way NE, at the intersection with Penny Drive, a private roadway. Penny Drive extends diagonally from Sand Point Way NE on the west to the Whale Garage on the east, and separates the existing hospital facilities. On the south and west sides of Penny Drive are the inpatient and outpatient facilities for patient care. On the north and east sides are parking, administrative offices in trailers, a nursery for plants, and evaporative cooling equipment. Along this path, all of the building entries are accessible. A secondary egress is located along the southeastern corner side of the campus accessible from NE 45th Street. This is a drive-through bus layover area, with a pedestrian and service vehicle connection to the Whale Garage and fire access along the south face of the building.

On the south side of Penny Drive, the tallest roof top elevation is approximately 90 feet in height. On the north side of Penny Drive, the highest building is the Giraffe Garage at 2.5 to 3 stories tall, below 37 feet in height.

The Master Plan for Children's as adopted in 1994 included 16 projects totaling 262,630 sf of additional space plus a new parking structure (Whale Garage). Most of the existing approved development has been completed, except for approximately 54,000 gross square feet (sf) of unbuilt area. ~~Approximately 20,000 – 25,000 sf of the unbuilt area is currently under design to add approximately 20 to 22 inpatient beds on a new floor on the top of the Train building.~~

Surrounding Land Uses

The area surrounding Children's is primarily single family homes, and includes a mixture of single- and multi-family residences, retail/commercial businesses, institutions, and recreational opportunities, such as the Burke-Gilman Trail, Laurelhurst Playfield, and Magnuson Park. The retail/commercial businesses are located primarily west of Children's along Sand Point Way NE,

and include University Village, restaurants and shops, an exercise gym, office space, and the Virginia Mason Pediatric Clinic. There are several institutions in the area, including the Children's 70th and Sand Point Way facility, churches, Talaris Research and Conference Center, Laurelhurst Elementary School, and Villa Academy. The nearest Major Institution in the area, the University of Washington, is less than a mile to the west. See Figure 1-1 for a site vicinity map.

Single-family and low and moderate density multi-family residences surround the hospital. The western edge of the hospital is adjacent to the 6.75-acre Laurelon Terrace multi-family development. Laurelon Terrace was built in the 1940s and consists of 136 units in twenty garden-style two to three-story buildings. The units are owned as condominiums. The elevation of the hospital site slopes from Elevation 170 feet at NE 45th Avenue to Elevation 60 feet on the western property line with Laurelon Terrace. Due to the 110 foot grade change, the buildings appear low on the eastern edge of the campus but commensurably taller on the western edge of the campus. Facing the southern portion of Laurelon Terrace, on the west side of 40th Avenue NE, are multi-family (duplex) buildings.

Properties to the south and east of the hospital are developed with single-family homes. The homes are separated from the hospital grounds on the south by NE 45th Street, a local arterial, and on the east by 45th Avenue NE and 44th Avenue NE. To the north, across NE 50th Street, the properties are duplex and triplex residences.

Children's has recently purchased some single family homes and Laurelon Terrace condominiums. In late February, 2008, Children's reached a tentative agreement with the Laurelon Terrace Condominium Association to purchase the entire 6.75-acre property. The condominium board submitted ~~is expected to put together~~ a final ~~deal~~ agreement to its members for signature by each consenting owner, and this agreement was approved by over 80 percent of the owners. On October 6, 2008, Children's and Laurelon Terrace signed a Purchase and Sale Agreement for the property. This is a binding agreement, committing Laurelon Terrace to sell the property to Children's and committing Children's to buy the property if the City Council approves the proposed Final Master Plan. ~~a formal vote by the condominium owners in early summer 2008~~. Unless changed by the MIO, the use would continue as residential even if totally owned by Children's. (See Section 3.8 for more information on existing housing and potential impacts.)

Hartmann

Children's also owns the Hartmann property located on the west side of Sand Point Way NE. The Hartmann property is developed with a one-story clinic and office constructed in 1958. There are 80 surface parking spaces. The west edge of the property fronts on the Burke-Gilman Trail. The east edge is adjacent to Sand Point Way NE. Multi-family buildings are located both north and south of the Hartmann property. The tallest of these multi-family developments is on Sand Point Way NE immediately south of the Hartmann property, and has a height of approximately 120 feet. The multi-family development to the north is lower, approximately 35 feet high along 40th Avenue NE.

Leased Space

Children's currently leases approximately ~~4,000~~6,700 sf at the Springbrook office complex located at the intersection of NE 45th Street and Sand Point Way NE. The Springbrook property is fully developed with two office buildings; one is a two-level structure and the other has three levels. The property is surrounded by commercial and multi-family residential uses within the neighborhood commercial center for Laurelhurst.

Children's also leases approximately 805 parking spaces at remote parking lots north of the hospital campus at the National Archives & Records Depository (at 61st Avenue NE and Sand Point Way NE), Magnuson Park, and the 13th Church, and south of campus at the University of Washington's E-1 parking lot[1]. Children's operates a shuttle connecting these parking lots to the hospital, 70th Avenue NE and Sand Point Way NE (70th and Sand Point Way), and other clinical partners in South Lake Union and at the University of Washington.

Decentralization

Children's provides pediatric specialty care at regional clinics in Bellevue, Everett, Federal Way and Olympia, and outreach clinics in Yakima, Wenatchee, and Kennewick, Washington, and sites in Alaska and Montana. A regional clinic in the Tri-Cities areas ~~is scheduled to~~ opened in ~~April~~ May 2008 and ~~will~~ provides regularly scheduled consultation and follow-up services in Cardiology, Gastroenterology, Genetics, Nephrology, Orthopedics, Prenatal cardiology, Pulmonary, and Rheumatology to serve children and their families in Benton/Franklin and surrounding counties. These clinics provide outpatient services only; they do not provide general pediatric or emergency care. In addition, Children's is working with community providers to increase the availability of pediatric specialty-care services in the area.

Research functions have been consolidated away from the hospital campus. In 2006, Children's purchased new research facilities and land for a total of 1.5 million gross square feet in the South Lake Union area of downtown Seattle. Children's is in the process of acquiring 6.6 acres near downtown Bellevue for a new outpatient facility, expected to open in 2010.

3.7.1.2 Land Use Regulations

City of Seattle Comprehensive Plan

The Comprehensive Plan "Toward a Sustainable Seattle," is a 20-year policy plan designed to articulate a vision of how Seattle will grow in ways that sustain its citizens' values. The City first adopted the plan in 1994 in response to the state Growth Management Act of 1990. The current plan contains amendments adopted by the Seattle City Council through the year 2005.

The Comprehensive Plan contains eleven elements: urban village, land use, transportation, housing, capital facilities, utilities, economic development, neighborhood planning, human development, cultural resource, and environmental. The *Future Land Use* Map, which is part of the plan, designates the Children's site as a Major Institution[2], with single family and City-

[1] At the time the traffic analysis was prepared, Children's was leasing 640 spaces, all north of their campus.
[2] See Chapter 5 Glossary for a definition of "Major Institution".

owned open space to the south and east, multi-family and City-owned open space to the west and north, and commercial along Sand Point Way NE.

The Land Use Element of the plan contains location-specific land use policies for Major Institutions. Under C-1 Major Institutions, the plan states:

> *Hospitals and higher educational facilities play an important role in Seattle. Institutions containing these facilities provide needed health and educational services to the citizens of Seattle and the region. They also contribute to employment opportunities and to the overall diversification of the city's economy. However, when located in or adjacent to residential and pedestrian-oriented commercial areas, the activities and facilities of major institutions can have negative impacts such as traffic generation, loss of housing, displacement and incompatible physical development.*
>
> *These policies provide a foundation for the City's approach to balancing the growth of these institutions with the need to maintain the livability of the surrounding neighborhoods.*

The City of Seattle Economic Land Use Map shows three uses for the hospital site: Public Facilities, Parking, and Mixed-Use. To the south and east of the ~~side~~site, the land use is Single Family. A mixture of Multi-Family, Retail/Service and open space is located north and west of the site. The established land use of the Hartmann site is medical services.

Zoning

The hospital campus is zoned as Single-Family Residential with an MIO, with height limits ranging from 37 feet to 90 feet. The Hartmann site is zoned Multi-family Residential, Low-rise 3 with a 30-foot height limit (L-3). The area immediately west and northwest of the hospital campus, including the Laurelon Terrace property, is also zoned L-3. North of the hospital, the surrounding area is zoned Low-rise Duplex/Triplex with a 25-foot height limit (LDT). The areas east, south and west of 39th Avenue NE are all zoned Single-Family Residential with a 30-foot height limit (SF 5000). See Figure 2-1 in Section 2, Description of Alternatives for existing zoning.

3.7.2 Impacts

Table 3.7-1 compares the estimated density of the Build Alternatives in terms of the approximate percentage of lot coverage, approximate acreage of open space, approximate percentage of the campus to remain in open space, and approximate floor area ratio. The density-related impacts of additional development, such as loss of housing, increased height, bulk and scale, increased noise, parking, increased traffic, and increased need for public services and utilities are addressed in other subsections within Section 3 of this ~~Draft~~ Final EIS. Height limits, height overlay photos, and the potential impacts of height, bulk and scale are discussed in Section 3.9, Aesthetics/Light, Glare and Shadows.

Table 3.7-1
Comparison of Density

	Property Size	Building (gross sf)	Approx. Lot Coverage Percentage	Approx. Open Space Acreage	Approx. Open Space Percentage	Approx. Floor Area Ratio
Alternative 1 - No Build	21.7 acres	900,000	35%	10.4 acres	48%	0.95
Alternative 3 – South Campus Expansion	23.48 acres	2,400,000	57%	7.81 acres	33%	2.35
Alternative 6 – Modified North Campus Expansion	21.70 acres	2,400,000	59%	6.70 acres	31%	2.54
Alternative 7R – Expanded Boundary, Early Laurelon Development	30.23 acres	2,400,000	51%	12.27 acres	41%	1.82
Alternative 8 – Early Laurelon Development without Hartmann	28.45 acres	2,400,000	52%	11.06 acres	39%	1.94

This land use impact analysis, in conformance with the City's SEPA Land Use Policy, is focused on ensuring that the proposed uses in development projects are reasonably compatible with surrounding uses and are consistent with any applicable, adopted City land use regulations, and the goals and policies set forth in Section C Major Institutions of the Seattle Comprehensive Plan regarding Location-Specific Land Use Categories. The project site is not located within a shoreline, and an analysis of the shoreline goals and policies set forth in section D-4 of the land use element of the Seattle Comprehensive Plan is not required.

3.7.2.1 Land Use

For all alternatives, detailed summaries of each alternative, including proposed MIO boundaries, and comparisons between alternatives can be found in Section 2, Description of Alternatives.

For all of the alternatives, the proposed Master Plan would continue the use of the hospital property and the Hartmann in medical uses. Alternatives 7R and 8 would require the conversion of multi-family housing (Laurelon Terrace condominiums) to medical use. A summary of the proposed changes in development is provided in Table 3.7-1a.

Table 3.7-1a
Proposed Change of Use – Comparison of Alternatives

	Property Size (acres)	Building (gross sf)	Proposed Change of Use of Campus	Proposed Change of Use of Hartmann	Proposed Change of Use of Laurelon Terrace
Alternative 1 – No Build	21.7	900,000	None; remain as Medical Major Institution	None; remain as medical service (clinic and office)	None; remain as multi-family housing
Alternative 3 – ~~Proposed~~South Campus Expansion	23.5	2,400,000	None; remain as Medical Major Institution	Change from medical service to Medical Major Institution	None; remain as multi-family housing
Alternative 6 – Modified North Campus Expansion	21.7 in MIO 23.5 total	2,400,000	None; remain as Medical Major Institution	None; remain as medical service (clinic and office)	None; remain as multi-family housing
Alternative 7R – Expanded Boundary, Early Laurelon Development	30.2	2,400,000	None; remain as Medical Major Institution	Change from medical service to Medical Major Institution	Change from multi-family to Medical Major Institution
Alternative 8 – Early Laurelon Development without Hartmann	28.4	2,400,000	None; remain as Medical Major Institution	None; remain as medical service (clinic and office)	Change from multi-family to Medical Major Institution

Construction Impacts

Secondary impacts on land use would be expected due to construction activities.

Alternative 1

Alternative 1 would include the construction of approximately 54,000 square feet remaining to be developed with the existing MIMP~~proposed approximately 20 to 22 inpatient bed addition to the Train building (approximately 20,000 to 25,000 sf of new construction). The additional inpatient bed use would be consistent with existing uses~~. As noted above in Section 3.7.1, Children's has recently purchased some single family homes and Laurelon Terrace condominiums. The use of these is governed by the existing zoning and would continue to be residential. The proposed uses would remain consistent with current uses.

Alternative 3

Alternative 3 would maintain the existing hospital and clinic uses on the hospital and Hartmann sites. This would have a secondary to no impact on surrounding land uses.

Alternative 6

The land use impacts for Alternative 6 would be the same as for Alternative 3.

Alternatives 7R and 8

Alternatives 7R and 8 would include the acquisition and conversion of the 6.75-acre Laurelon Terrace condominium site to hospital use. This would be an impact on land use.

Both Laurelon Terrance and the property to the southwest across 40th Avenue NE are zoned L-3, and both are developed with multi-family buildings. There appears to be one single family home at the northwest corner of NE 45th Street and 40th Avenue NE, located within the L-3 zone. To the west of this L-3 zone, is land zoned NC2-40 that contains the Springbrook office complex. The redevelopment of the Laurelon Terrace property will change the use from multi-family to Medical Major Institution. This will cause the remaining multi-family zoned land to become a half block wide zone of multi-family, between commercial property on the west and Medical Major Institution on the west. This would be an impact on land use.

Seattle's SEPA ordinance, SMC 25.05.675 subsection H~~.~~, requires consideration of the historic significance of older buildings that appear to meet the criteria for designation under the City's landmarks preservation ordinance. Designation as a historic landmark under SMC 25.12.350 requires that a building satisfy all three of the following criteria; (1) be more than 25 years old, (2) meet a threshold standard of historic significance and integrity to convey that significance, and (3) qualify under one or more specific categories of significant historic importance. Laurelon Terrace was constructed in 1949 and is over 25 years old. The Hartmann Building was constructed in 1958 and is also over 25 years old. On September 3, 2008, the City's Landmarks Preservation Board voted to deny the designation of the Laurelon Terrace condominiums based on the finding that this property does not meet any of the designation standards of SMC 25.12.350. If Alternative 7R is approved, a similar review of the Hartmann building would be performed.~~While the City has not concluded that the redevelopment of Laurelon Terrace "appears to meet the criteria for designation", the applicant has agreed to comply with the nomination requirements under the City's Landmark preservation ordinance.~~

Decentralization

In December 2007, Children's approved plans to purchase 6.6 acres near downtown Bellevue for a new outpatient facility, expected to open in 2010. Similar clinics are planned for Everett and South King County. Assuming that the proposed or future sites are appropriately zoned for medical clinic use, the clinics would have secondary to no impacts on land use.

3.7.2.2 Land Use Regulations

City of Seattle Comprehensive Plan

The Children's site is designated as a Major Institution on the City's *Future Land Use* Map. The Hartmann site and the Laurelon Terrace Condominium sites are both designated as multi-family. Land to the south and east of Children's is designated as single family. In applying and determining compliance with the numerous goals and policies of the Comprehensive Plan, the City must balance the needs of the institution with the protection of residential and commercial uses. This balance ~~will occur~~is considered as part of the Major Institution Master Plan approval process~~ at the City Council~~.

Compliance with the Urban Village Element of the Comprehensive Plan

Children's site and the two areas proposed for expansion (Hartmann and Laurelon Terrace) are not located within an area designated by the City as an "Urban Village". Children's is located approximately 0.5 mile from the Ravenna portion of the University Community Urban Center.

Section A-2 of the Urban Village Element has policies that pertain to "Areas Outside of Centers & Villages". Table 3.7-2 provides an analysis of how the Children's proposed Master Plan would comply with those policies.

Table 3.7-2
Consistency with Urban Village Policies

Areas Outside of Centers & Villages	Consistency of Children's Master Plan
UV35 Provide that the area of the city outside urban centers and villages remain primarily as residential and commercial areas with allowable densities similar to existing conditions, or as industrial areas, or major institutions.	Children's is designated as a major institution and is located outside of an urban center or village, and is therefore consistent with this policy.
UV36 Protect single-family areas, both inside and outside of urban villages. Allow limited multifamily, commercial, and industrial uses outside of villages to support the surrounding area or to permit the existing character to remain.	~~Not applicable; n~~No conversion of single family zoning is proposed.
UV37 Recognize neighborhood anchors designated in adopted neighborhood plans as important community resources that provide a transit and service focus for those areas outside of urban villages.	~~Not applicable;~~ Children's is not located in a recognized neighborhood anchor area nor does Laurelhurst have an established neighborhood plan.
UV38 Permit limited amounts of development consistent with the desire to maintain the general intensity of development that presently characterizes the multifamily, commercial, and industrial areas outside of urban centers and villages and direct the greatest share of growth to the urban centers and villages.	This policy must be balanced with Policy UV39 below which requires that growth consistent with adopted master plans be accommodated within the City. This balance will occur as part of the Major Institution Master Plan approval process.

UV39 Accommodate growth consistent with adopted master plans for designated major institutions located throughout the city.	Children's is a designated major institution, has an adopted master plan, and has asked for City approval of a new master plan.

Compliance with the Land Use Element of the Comprehensive Plan

Section A of the Land Use Element of the Comprehensive Plan includes City-wide land use policies. One policy, LU6, specifically pertains to major institutions.

Table 3.7-3
Consistency with Citywide Land Use Policies

Citywide Land Use Policies	Consistency of Children's Master Plan
LU6 In order to focus future growth, consistent with the urban village strategy, limit higher intensity zoning designations to urban centers, urban villages, and manufacturing/ industrial centers. Limit zoning with height limits that are significantly higher than those found in single-family areas to urban centers, urban villages, and manufacturing/industrial centers and to those areas outside of urban villages where higher height limits would be consistent with an adopted neighborhood plan, a major institution's adopted master plan, or with the existing built character of the area.	Children's is a designated major institution, has an adopted master plan, and has asked for City approval of a new master plan.

Section B of the Land Use Element of the Comprehensive Plan includes policies and land use goals that pertain specifically to the protection of single family and multi-family land use categories, however, Section C Location-Specific Land Use policies states that, "*The basic zoning categories described in Section B, are augmented here by policies that respond to specific characteristics of an area. For example, historic districts are governed by a basic zoning category as well as regulations that respond to the unique historic characteristics of an area. This section provides the policy foundation to guide how the City adjusts its regulations to respond to unique environments, particularly those created by: major institutions, historic districts and landmarks, environmentally critical areas and shorelines.*"

Consistency with the Section C Location-Specific Land Use Policies relevant for Major Institution are shown in Table 3.7-4.

Table 3.7-4
Consistency with Major Institution Goals and Policies

Major Institution Goals and Policies	Consistency of Children's Master Plan
Goals	
LUG32	
Maximize the public benefits of major institutions, including health care and educational services, while minimizing the adverse impacts associated with development and geographic expansion.	With Alternatives 3 and 7R, the MIO boundary is proposed to be expanded to a site (Hartmann) that is currently used for health care. ~~One~~ Two alternatives, Alternatives 7R and 8, would convert residential land

Major Institution Goals and Policies	Consistency of Children's Master Plan
	(Laurelon Terrace) to hospital uses. While this conversion would impact multi-family housing, it would somewhat lessen the impact on single-family housing located east of the hospital by re-directing hospital development toward Sand Point Way NE as compared to Alternatives 3 and 6.
LUG33	
Recognize the significant economic benefits of major institutions in the city and the region and their contributions to employment growth.	As an indicator, Children's identified 2006 expenditures including $216 million in employee salaries and benefits and over $230 million in supplies, renovation and new equipment. (Warren Hewitt, February 2007)
LUG34	
Balance each major institution's ability to change and the public benefit derived from change with the need to protect the livability and vitality of adjacent neighborhoods.	This balance will occur as part of the Major Institution Master Plan review and approval process.
LUG35	
Promote the integration of institutional development with the function and character of surrounding communities in the overall planning for urban centers.	Although the Laurelhurst and Bryant neighborhoods ~~is~~ are not ~~an~~ identified urban centers, a goal of the MIMP process is to plan for future development that is effectively integrated with its surrounding communities.
Policies	
LU180	
Designate the campuses of large hospitals, colleges and universities as Major Institutions to recognize that a separate public process is used to define appropriate uses in the areas.	Children's is designated as a Major Institution.
LU181	
Provide for the coordinated growth of major institutions through major institution conceptual master plans and the establishment of major institution overlay zones.	Children's initiated this process by proposing its future master plan and updates to its MIO, subject to review and approval.
LU182	
Establish Major Institution Overlays (MIO) to permit appropriate institutional development within boundaries while minimizing the adverse impacts associated with development and geographic expansion. Balance the public benefits of growth and change for major institutions with the need to maintain the livability and vitality of adjacent neighborhoods. Where appropriate, establish MIO boundaries so that they contribute to the compatibility between major institution areas and less intensive zones.	Children's has operated within an MIO since 1994. Children's initiated this process by proposing its future master plan and updates to its MIO, subject to review and approval.
LU183	
Allow modifications to the underlying zone provisions in order to allow major institutions to thrive while ensuring that impacts of development on the surrounding neighborhood are satisfactorily mitigated.	The decision on zoning modifications as described by Major Institution Overlay (MIO) heights and setbacks to accommodate additional heights will be made by the City Council as part of the Major Institution Master Plan approval process.
LU184	

Major Institution Goals and Policies	Consistency of Children's Master Plan
Allow all functionally integrated major institution uses within each overlay district, provided the development standards of the underlying zone are met. Permit development standards specifically tailored for the major institution and its surrounding area within the overlay district through a master plan process.	Children's has requested approval for development standards specifically tailored to their needs. The decision on whether to approve the development standards will be made by the City Council as part of the Major Institution Master Plan approval process.
LU185	
Allow modification of use restrictions and parking requirements of the underlying zoning by the overlay to accommodate the changing needs of major institutions, provide flexibility for development and encourage a high-quality environment. Allow modification of the development standards and other requirements of the underlying zoning by an adopted master plan.	Children's has requested approval for modifications to zoning and development standards specifically tailored to their needs. The decision on whether to approve the development standards will be made by the City Council as part of the Major Institution Master Plan approval process.
LU186	
Discourage the expansion of established major institution boundaries.	Alternative 6 would maintain the existing boundary of Children's MIO. Alternatives 3 and 7R would both include an expansion of the established boundaries to include the Hartmann property, and for Alternatives 7R and 8, an expansion to include the Laurelon Terrace property. While the expansion options may provide benefits in terms of lower heights and dispersed traffic, the City Council must balance this policy against others as part of the Major Institution Master Plan review and approval process.
LU187	
Encourage significant community involvement in the development, monitoring, implementation and amendment of major institution master plans, including the establishment of citizen's advisory committees containing community and major institution representatives.	The Department of Neighborhoods and Children's have established a citizen's advisory committee, held several public open houses to share information, provide updates on Children's website, and are following the Seattle Major Institution Master Plan process.
LU188	
Encourage Advisory Committee participation throughout the process of revision, amendment and refinement of the master plan proposal.	The Advisory Committee is actively participating in the revision, amendment and refinement process. Their continued participation has been encouraged by both the City of Seattle and Children's.
LU189	
Require preparation of either a master plan or a revision to the appropriate existing master plan when a major development is proposed that is part of a major institution, and does not conform with the underlying zoning and is not included in an existing master plan.	Due to the scope of Children's proposed future development, the institution is required to prepare a new master plan in conformance with this policy. Approval of a new master plan has been requested by Children's.
LU190	
Provide procedures for considering the establishment of new major institutions.	Not applicable; Children's is a designated Major Institution.
LU191	
Locate new institutions in areas where such activities are compatible with the surrounding land uses and where the impacts associated with existing and future development can be appropriately mitigated.	Not applicable; Children's is a designated Major Institution located in an area designated as "major institution".

Major Institution Goals and Policies	Consistency of Children's Master Plan
Uses	
LU192	
Define all uses that are functionally integrated with, or substantively related to, the central mission of the major institution or that primarily and directly serve the users of the institution as major institution uses and permit these uses in the Major Institution Overlay district, subject to the provisions of this policy, and in accordance with the development standards of the underlying zoning classifications or adopted master plan.	The existing and proposed Master Plan defines all primary and associated uses as major institution uses.
Development Standards	
LU193	
Apply the development standards of the underlying zoning classification for height, density, bulk, setbacks, coverage and landscaping for institutions to all major institution development, except for specific standards altered by a master plan.	The underlying zoning standards have been modified by the existing Major Institution Overlay. Children's has requested additional modifications in the proposed Master Plan. Approval for these modifications will be determined by the City Council.
LU194	
The need for appropriate transition shall be a primary consideration in determining setbacks.	Children's has proposed to maintain the existing setbacks that were approved in their existing Major Institution Master Plan. The establishment of setbacks for new areas (Hartmann and Laurelon Terrace) would be made as part of the Master Plan approval.
Parking Standards	
LU195	
Establish minimum parking requirements in MIO districts to meet the needs of the major institution and minimize parking demand in the adjacent areas. Include maximum parking limits to avoid unnecessary traffic in the surrounding areas and to limit the use of single occupancy vehicles (SOV).	Children's has proposed to meet the Land Use Code required parking amounts. Additional parking demand would be met partially through implementation of a Transportation Management Plan (TMP) and off-site parking~~ a Comprehensive Safety and Mobility Plan (CSMP)~~. Children's existing TMP reports show a reduction in the use of SOVs to 38 percent.
LU196	
Allow short-term or long-term parking space provisions to be modified as part of a Transportation Management Program (TMP).	Children's has proposed to meet the Land Use Code required parking amounts. Additional parking demand would be met partially through implementation of a Transportation Management Plan (TMP) and off-site parking~~a Comprehensive Safety and Mobility Plan (CSMP)~~.
LU197	
Allow an increase to the number of permitted spaces only when an increase is necessary to reduce parking demand on streets in surrounding areas and is compatible with goals to minimize traffic congestion in the area.	~~A final determination on~~Children's has proposed an increase in the ~~required~~ number of parking spaces ~~will be made~~ as part of ~~the~~ its Final Master Plan~~ and discussed in the Final EIS~~ in order to accommodate its proposed facility expansion.

Major Institution Goals and Policies	Consistency of Children's Master Plan
LU198	
Use the TMP to reduce the number of vehicle trips to the major institution, minimize the adverse impacts of traffic on the streets surrounding the institution, minimize demand for parking on nearby streets, especially residential streets, and minimize the adverse impacts of institution-related parking on nearby streets. To meet these objectives, seek to reduce the number of SOVs used by employees and students to reach the campus at peak times.	See Section 3.10 Transportation for a summary of proposed mitigation measures to be included in the TMP.
Residential Structures	
LU199 Encourage the preservation of housing within major institution overlay districts and the surrounding areas. Discourage conversion or demolition of housing within a major institution campus, and allow such action only when necessary for expansion of the institution. Prohibit demolition of structures with non-institutional residential uses for the development of any parking lot or parking structure which could provide non-required parking or be used to reduce a deficit of required parking spaces. Prohibit development by a major institution outside of the MIO district boundaries when it would result in the demolition of structures with residential uses or change of these structures to non-residential uses.	No housing exists on the main campus. ~~One~~ Two alternatives, Alternative 7R and 8 ~~Expanded Boundary~~, would include the 6.75-acre site currently occupied by the 136-unit Laurelon Terrace condominiums. ~~Under thiese alternatives, Children's would need to demonstrate that demolition of housing within an expanded MIO district would be necessary for expansion of the institution.~~ Section 23.34.124(7) of the Seattle Municipal Code precludes the expansion of MIO boundaries where *"they would result in the demolition of structures with residential use unless comparable replacement is proposed to maintain the housing stock of the city."* ~~Children's has informed the Department of Planning and Development that they plan to work in partnership with public agencies, non-profit organizations, housing developers and neighborhood groups to maximize the opportunities to leverage more affordable housing in northeast Seattle. Children's is proposing to meet their housing replacement responsibilities by contributing to the development of 136 new units of housing in northeast Seattle. To begin this project, Children's has stated that they will contribute to the development of 52 units of housing at Sand Point Magnuson scheduled for groundbreaking in fall of 2009.~~ Children's has informed the City's Office of Housing that it will meet, and to the extent feasible and cost-effective, exceed housing replacement responsibilities for the demolition of Laurelon Terrace. Children's says it will work with non-profit housing organizations and the City's Office of Housing and DPD to establish a binding agreement for a specific package of replacement housing. The housing replacement package is intended to address the City's policy and program goals for comparable affordable housing and contribute to the replacement of at least 136 housing units in northeast Seattle. They have also said that participation in the development of affordable housing at Sand Point Magnuson will be a component of the agreement. The approval on whether the proposed replacement housing constitutes "comparable replacement" would be made by the City as part of the Major Institution Master Plan review and approval process~~Seattle City Council~~.

Major Institution Goals and Policies	Consistency of Children's Master Plan
Master Plan	
LU200	
Require a master plan for each Major Institution proposing development which could affect the livability of adjacent neighborhoods or has the potential for significant adverse impacts on the surrounding areas. Use the master plan to facilitate a comprehensive review of benefits and impacts of the Major Institution development.	Children's has submitted a ~~draft~~ Final Master Plan to the City for review and approval.
LU201	
Use the master plan to: Give clear guidelines and development standards on which the major institutions can rely for long-term planning and development; Provide the neighborhood advance notice of the development plans of the major institution; Allow the City to anticipate and plan for public capital or programmatic actions that will be needed to accommodate development; and Provide the basis for determining appropriate mitigating actions to avoid or reduce adverse impacts from major institution growth.	Children's has applied to the City for approval of a new Master Plan. The Master Plan approval process is being conducted in conformance with this policy.
LU202	
The master plan should establish or modify boundaries; provide physical development standards for the overlay district; define the development program for the specified time-period; and describe a transportation management program.	Children's has applied to the City for approval of a new Master Plan. The proposed Master Plan includes a request to modify boundaries for Alternatives 3, ~~and~~ 7R and 8, requests approval of physical development standards for the MIOs, includes a proposed development schedule for a 20-year period, and includes a draft transportation management program.
LU203	
Require City Council review and adoption of the master plan following a cooperative planning process to develop the master plan by the Major Institution, the surrounding community and the City.	The intent of the master plan process is to achieve the goal outlined in this policy. Children's is currently engaged in a cooperative planning process to develop and refine its draft Master Plan with the Citizens Advisory Committee.
LU204	
In considering rezones, the objective shall be to achieve a better relationship between residential, commercial or industrial uses and the Major Institution uses, and to reduce or eliminate major land use conflicts in the area.	The proposed MIO height limit changes require a rezone. One alternative, Alternative 6, also includes a proposal to rezone the Hartmann side from L-3 to NC3-65'. The rezone decisions will be made by the City Council as part of their consideration of approval of the requested Master Plan.

Zoning

The underlying zoning of the hospital campus is single family, and the underlying zoning of both the Laurelon Terrace condominium site and the Hartmann site is Lowrise-3 (multi-family). The current Master Plan includes a City-approved Major Institution Overlay for the hospital campus

which revises the development standards for the underlying single family zoning. A revision to the existing MIO would be required to implement the proposed heights for each of the action alternatives. A summary of existing and proposed height limits is provided in Table 3.7-5.

Table 3.7-5
Existing and Proposed Height Limits

Alternative	Height South of Penny Drive	Height North of Penny Drive	Height on Hartmann Property	Height on Laurelon Terrace Property
Alternative 1 – No Build (existing)	37', 50', 70' and 90'	37'	30'	(30' – outside of MIO)
Alternative 3 – ~~Proposed~~South Campus Expansion	37', 50', 70', 90' and 105' on the east, 37', 50', 90', 105' and 160' on the west;	50'	50' and 105'	(30' – outside of MIO)
Alternative 6 – North Campus Expansion	37', 50', 65', 70', and 90 on the east, 37', 50', 70', 90' and 160' on the west	37', 50', 65' and 90'	(rezoned to NC3-65' – outside of MIO)	(30' – outside of MIO)
Alternative 7R – Expanded Boundary, Early Laurelon Development	37', 50', 70', and 90' on the east, 50', 70', 90' and 160' on the west	37' and ~~50'~~65'	65'	37', 50' and 160'[3]
Alternative 8 – Early Laurelon Development without Hartmann	37', 50', 70' and 90' on the east, MIO of 50', 70', 90' and 160' on the west	37' and 65'	30'	37', 50' and 160'

Regulation of Major Institutions

Major Institutions are regulated by SMC Section 23.69.002:

> ***SMC 23.69.002*: *Purpose and Intent***
>
> *The purpose of this chapter is to regulate Seattle's major educational and medical institutions in order to:*
>
> *A. Permit appropriate institutional growth within boundaries while minimizing the adverse impacts associated with development and geographic expansion;*
>
> *B. Balance a Major Institution's ability to change and the public benefit derived from change with the need to protect the livability and vitality of adjacent neighborhoods;*
>
> *C. Encourage the concentration of Major Institution development on existing campuses, or alternatively, the decentralization of such uses to locations more than two thousand five hundred (2,500) feet from campus boundaries;*
>
> *D. Provide for the coordinated growth of major institutions through major institution conceptual master plans and the establishment of major institutions overlay zones;*

[3] Children's is proposing to limit the height of development on the Laurelon Terrace site to 140 feet.

E. Discourage the expansion of established major institution boundaries;

F. Encourage significant community involvement in the development, monitoring, implementation and amendment of major institution master plans, including the establishment of citizen's advisory committees containing community and major institution representatives;

G. Locate new institutions in areas where such activities are compatible with the surrounding land uses and where the impacts associated with existing and future development can be appropriately mitigated;

H. Accommodate the changing needs of major institutions, provide flexibility for development and encourage a high quality environment through modifications of use restrictions and parking requirements of the underlying zoning;

I. Make the need for appropriate transition primary considerations in determining setbacks. Also setbacks may be appropriate to achieve proper scale, building modulation, or view corridors;

J. Allow an increase to the number of permitted parking spaces only when it is 1) necessary to reduce parking demand on streets in surrounding areas, and 2) compatible with goals to minimize traffic congestion in the area;

K. Use the TMP to reduce the number of vehicle trips to the major institution, minimize the adverse impacts of traffic on the streets surrounding the institution, minimize demand for parking on nearby streets, especially residential streets, and minimize the adverse impacts of institution-related parking on nearby streets. To meet these objectives, seek to reduce the number of SOVs used by employees and students at peak time and destined for the campus;

L. Through the master plan: 1) give clear guidelines and development standards on which the major institutions can rely for long-term planning and development; 2) provide the neighborhood advance notice of the development plans of the major institution; 3) allow the city to anticipate and plan for public capital or programmatic actions that will be needed to accommodate development; and 4) provide the basis for determining appropriate mitigating actions to avoid or reduce adverse impacts from major institution growth; and

M. Encourage the preservation, restoration and reuse of designated historic buildings.

Children's proposed expansion plans in either Alternative 3, ~~or~~ 7R or 8 would include development outside of their existing campus, in potential conflict with the goals of items C and E above. Neither statements C ~~and~~ nor E prohibit an expansion of a major institution boundary, but do include the words "*Encourage the concentration…on existing campuses*" and "*Discourage the expansion of established major institution boundaries*". These two statements are consistent with the Comprehensive Plan Policy LU 186 "*Discourage the expansion of established major institution boundaries*."

However, there are other policies in the Land Use Element of the Comprehensive Plan that appear to allow for boundary expansions. These policies include:

- ***LU**G32: Maximize the public benefits of major institutions, including health care and educational services, while minimizing the adverse impacts associated with development and geographic expansion.*
- ***LU**181: Provide for the coordinated growth of major institutions through major institution conceptual master plans and the establishment of major institution overlay zones.*
- ***LU**182: Establish Major Institution Overlays (MIO) to permit appropriate institutional development within boundaries while minimizing the adverse impacts associated with development and geographic expansion. Balance the public benefits of growth and change for major institutions with the need to maintain the livability and vitality of adjacent neighborhoods. Where appropriate, establish MIO boundaries so that they contribute to the compatibility between major institution areas and less intensive zones.*

The balance between these policies of discouraging expansion of established boundaries and providing for the coordinated growth of a major institution will occur as part of the Major Institution Master Plan approval process. Policies that provide for the coordinated growth of the major institution coexist with policies that discourage expansion of established institutional boundaries. The Major Institution Master Plan process applies general policy concerns to the more specific context of the site and vicinity, the development program, the impact analysis, and proposed mitigations. ~~Applied to the proposed master plan, policies that discourage geographic expansion of the established institutional boundaries are clearly at odds with several proposed alternatives.~~ While the policies are not intended to explicitly prohibit or permit expansions, they do present a range of issues to be evaluated and weighed against the potential benefits of a Master Plan approval. Boundary expansions may also present a range of potential mitigation measures not otherwise possible within the existing MIO. DPD notes the stated concern over boundary expansion and will evaluate it in the context of the specific environment, the impacts, and the proposed mitigations in order to determine whether to approve, deny or amend the proposed Major Institution Master Plan.

3.7.3 Mitigation Measures

Mitigation for the density-related impacts of additional development, such as loss of housing, increased height, bulk and scale, increased noise, parking, increased traffic, and increased need for public services and utilities are addressed in other subsections within Section 3 of this ~~Draft~~ Final EIS. No significant impacts to land use have been identified, and no mitigation measures are required.

3.7.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts to land use have been identified. The potential for significant adverse impacts for density-related impacts such as loss of housing or increased height, bulk and scale, are addressed in other subsections within Section 3 of this ~~Draft~~ Final EIS.

3.7.5 Secondary and Cumulative Impacts

The increase in staffing and patient levels at the hospital would contribute to secondary and cumulative land use changes, both directly and indirectly. There would be increased demands for customer service-type businesses in the nearby retail/commercial area to serve hospital staff, patients and visitors. There may be increased future demand for more intensive zoning along Sand Point Way NE to accommodate additional retail and commercial space. The overall impact is not expected to be significant when viewed in the context of existing and proposed future land uses.

For Alternatives 7R or 8, ~~The~~ the conversion of the Laurelon Terrace property from multi-family to Medical Major Institution would cause the remaining multi-family zoned land across 40th Avenue NE to become a half block wide zone of multi-family, between commercial property on the west and Medical Major Institution on the west. This land may be subject to future requests for rezone.

3.8 Housing

The information contained in this section on housing characteristics and population was obtained from the US Census Bureau. The US Census Bureau uses Census Tracts and Community Reporting Areas (CRAs) to report census information.

The City of Seattle Comprehensive Plan on Housing plans for at least one-quarter of the city housing stock to be affordable to households with incomes up to 50% of the area's median income. This goal incorporates housing that is publicly subsidized and housing provided by the private housing market. The Plan encourages the use of public funds for the production and preservation of low-income housing in urban centers and villages. It also encourages the production of housing for households with incomes up to 50% of the median in areas with high land values and little existing rental housing in that income range.

3.8.1 Affected Environment

The Census Bureau's northeast neighborhood study area includes approximately 16 Census Tracts. Its approximate boundaries include NE 98th Street to the north, Lake Washington to the east, East Galer Street to the south, and Roosevelt Way NE to the west. Within this neighborhood study area is the Laurelhurst/Sand Point Way CRA which includes Census Tracts 40 and 41. Children's is located within Census Tract 41.

The Laurelhurst/Sand Point CRA reflects the most immediate data surrounding Children's. The northeast neighborhood study area represents a broader view of housing near Children's.

All of the following data is current as of the 2000 US Census. Table 3.8-1 compares the Laurelhurst/Sand Point CRA, the northeast neighborhood, and the city of Seattle in characteristics such as population, housing units, and income.

Table 3.8-1
Population, Housing and Income Characteristics

	Laurelhurst/Sand Point CRA	Northeast Neighborhood	City of Seattle
Population	9,857	71,855	563,374
Housing Units	4,328	30,135	270,536
Single Family	3,679 (85%)	27,122 (90%)	227,250 (84%)
Multi-family of less than 10 units	210 (5%)	1,808 (6%)	16,232 (6%)
Multi-family of more than 10 units	439 (10%)	1,205 (4%)	27,054 (10%)
Occupied housing units	4,168	29,142	258,510
Owner occupied	3,083 (74%)	16,619 (57%)	125,151 (48%)
Renter occupied	1,085 (26%)	12,523 (43%)	133,359 (52%)
Median household income	$72,398	$34,640	$45,736
Median Value for Single-family Homes	**$484,860**	**$331,739**	**$252,100**

Source: 2000 US Census, Summary File 3

3.8.1.1 Housing Comparison

The Laurelhurst/Sand Point Way CRA contains approximately 1.7 percent of Seattle's population, and approximately 1.6 percent of Seattle's housing units. The percentage of single family homes (85 percent), and the percentage of multi-family units (5 percent in buildings of less than 10 units and 10 percent in buildings of 10 or more units) is similar to the city-wide percentages. In comparison with the northeast neighborhood, the percentage of single family homes (85 percent) is less than the overall percentage of 90 percent, and the percentage of multi-family units is greater.

As compared to Seattle as a whole, there is a higher percentage of housing within the Laurelhurst/Sand Point CRA that is classified by the Census Bureau as "large" (three or more bedrooms). Approximately 60 percent of housing units in the CRA are large, while within Seattle approximately 35 percent of the housing units are large.

The Laurelhurst/Sand Point Way CRA has a higher percentage of owner-occupied units than city-wide or in the northeast neighborhood. Within the CRA, approximately 74 percent of the housing units are owned, and approximately 26 percent are rented. Within the northeast neighborhood, approximately 57 percent of the housing units are owned, while approximately 43 percent are rented. In the rest of the city, approximately 48 percent of the housing units are owned and 52 percent are rented.

Median value for owner-occupied housing units within the CRA was $484,860. The median value for owner-occupied housing units within the northeast neighborhood was $331,739, substantially lower than the value within the CRA.

3.8.1.2 Rental Housing

As shown in Table 3.8-1, approximately 26 percent of the housing in the Laurelhurst/Sand Point CRA is occupied by renters. Of the 1,085 rental units in the CRA, approximately 18 percent are single-family homes (detached), while approximately 47 percent (510 units) are in multi-family structures with 10 or more units. Approximately 35 percent (380 units) are in duplex or triplex buildings, or other buildings of less than 10 units. These percentages are very similar to the northeast neighborhood and Seattle amounts.

Median rent within the CRA was $715 per month in 2000, compared to $695 per month in the northeast neighborhood and $677 in Seattle. A breakdown of contract rent is shown in Table 3.8-2.

Table 3.8-2
Contract Rent

Rent	Laurelhurst/Sand Point CRA	Northeast Neighborhood	City of Seattle
	Number of Units		
$0 to $299	10	380	12,862
$300 to $549	131	2,692	24,716
$550 to $799	482	4,713	50,692
$800 to $1,999	368	4,365	41,016
$2,000 or more	27	107	1,564
TOTAL	1,018	12,257	130,850
Median contract rent	**$715.00**	**$695.00**	**$677.00**

Source: 2000 US Census, Summary File

3.8.1.3 Housing Characteristics near Children's

Available housing in the Laurelhurst neighborhood is predominantly single-family homes. As detached homes typically have a higher value than attached housing, there is limited availability of moderately priced housing.

The Laurelon Terrace is a group of 136 condominiums located immediately west of Children's (See Figure 1-1). The condominiums were built in 1949, almost 60 years ago. There are approximately 650 attached units within the CRA. Laurelon Terrace's units represent approximately 21 percent of the total attached housing in the CRA, and approximately 5 percent of the total attached housing in the northeast neighborhood. Facing the southern portion of Laurelon Terrace, on the west side of 40th Avenue NE, are multi-family (duplex) buildings.

Children's has recently purchased some single-family homes in the area immediately surrounding the hospital and over ~~thirty~~ sixty units in Laurelon Terrace. In late February, 2008, Children's reached a tentative agreement with the Laurelon Terrace Condominium Association to purchase the entire 6.75-acre property for $93 million, approximately 2.8 times the market value of each individual unit. The agreement was based on a straw poll of the 136 condominium owners in which 120 residents voted in favor of the deal, three voted against it, one abstained and 12 did not vote. The straw poll was used to gauge owner support for the deal. Pursuant to State law, as amended by the 2008 Legislature, 80% of Laurelon Terrace owners must approve the decision to terminate the Condominium Association and sell the Condominium property. The condominium board submitted a final agreement to its members for signature by each consenting owner, and this agreement was approved by over 80 percent of the owners. On October 6, 2008, Children's and Laurelon Terrace signed a Purchase and Sale Agreement for the property. This is a binding agreement, committing Laurelon Terrace to sell the property to Children's and committing Children's to buy the property if the City Council approves the proposed Final Master Plan.~~The Laurelon Terrace Condominium Board is expected to put together a final agreement for a formal vote by the condominium owners in early summer 2008.~~

3.8.1.4 Housing for Patient Families

There are a number of existing housing options for patient families as described below.

At Bedside

Most inpatient rooms have a sleeper chair or couch for one parent/legal guardian to stay at the bedside overnight, depending on the condition of the patient, space and safety.

Intensive Care Unit Sleeping Areas

A limited number of sleep rooms are assigned daily to parents of ICU patients based on availability and eligibility.

Ronald McDonald House

Ronald McDonald House Charities (RMH) provides low-cost housing for qualifying Children's families. RMH can house up to 80 families per night and is located one block from Children's. There is onsite parking and free transportation between Children's and Ronald McDonald House.

Trailer Hookups

Children's offers limited RV spots with electrical hookups for patients' families.

Hotels

Table 3.8-3 identifies hotels that are located within ten miles of the Children's campus. Those hotels that provide a shuttle service to Children's are marked with an asterisk.

Table 3.8-3
Hotels Within Ten Miles of Children's Campus

Name	Address	Distance from Children's
Silver Cloud Inn – University*	5036 25th Ave NE	1.5 miles
Hotel Deca	4507 Brooklyn Ave NE	1.7 miles
College Inn	4000 University Way NE	1.9 miles
Watertown*	4242 Roosevelt Way NE	2.0 miles
University Inn*	4140 Roosevelt Way NE	2.1 miles
Quality Inn & Suites	225 Aurora Ave N	4.1 miles
The Baroness Hotel*	1005 Spring St	4.2 miles
Emerald Inn	8512 Aurora Ave N	4.9 miles
First Hill Apartments	400 10th Ave E	5.5 miles
Studio 6 Mountlake Terrace Motel	6017 244th St SW	10 miles

* Shuttle service available

Local Recreational Vehicle Parks

There are two recreational vehicle parks within 11 miles of Children's campus (Table 3.8-4).

Table 3.8-4
Recreational Vehicle Parks Within Eleven Miles of Children's Campus

Name	Address	Distance from Children's
University Trailer Park	2200 N.E. 88th Street	2.9 miles
Holiday Resort Hotel & Trailer Park	19250 Aurora Ave. N.	10.4 miles

3.8.2 Impacts

3.8.2.1 Alternative 1

With Alternative 1, staffing and patient levels would minimally increase over current levels.

It is anticipated that Children's would ~~complete its~~continue to purchase ~~of~~ units in Laurelon Terrace~~ and continue to purchase units in the immediate area surrounding the hospital if the owners approach Children's with a desire to sell their homes~~. The neighborhood homes previously offered by owners and purchased by Children's, and Laurelon Terrace condominiums are zoned for residential use and could only be used for residential use. If Children's rents these units to staff or families of patients, it could increase the amount of renter-occupied housing in the immediate neighborhood; however, this increase would be a small percentage of the area's housing stock.

3.8.2.2 Alternatives 3 and 6

If one of these alternatives were selected, there could be a greater need for housing due to the increased number of visitors, families of patients, and staff which would likely be dispersed throughout the region. Visitors and families would likely be using temporary housing which may increase demand for the hotel rooms and recreational vehicle spaces identified in Subsection 3.8.1.4.

Staff members would need permanent housing. Some of this need could be met by Children's renting recently-purchased single-family homes. As with Alternative 1, if Children's rents these units to staff or families of patients, it could increase the amount of renter-occupied housing in the immediate neighborhood; however, this increase would be a small or minor percentage.

Alternatives 3 and 6 do not include an expansion of the existing MIO to include the Laurelon Terrace property. ~~Assuming the proposed sale of the property to Children's is completed,~~ Children's would be required to continue using units it owns in Laurelon Terrace in conformance with the existing multi-family zoning. The property could be redeveloped, but only for housing or uses permitted within a multi-family zone. Uses permitted within the multi-family zone~~d~~ include single-family dwelling units, multifamily structures, congregate residences, adult family homes, nursing homes, assisted living facilities; institutions meeting all development standards; public facilities meeting all development standards; and parks and open space including

customary buildings and activities. Major institutions are permitted, but only through the Major Institution Master Plan process. This is the permitting approval proposed for Alternative 7R or 8.

3.8.2.3 Alternatives 7R and 8

With Alternatives 7R and 8, the existing MIO boundary would be expanded to include the property currently developed as the Laurelon Terrace condominiums. This 6.75-acre site contains 136 units, over ~~30~~ 60 of which have already been purchased by Children's. On October 6, 2008, Children's and Laurelon Terrace signed a Purchase and Sale Agreement for the property. This is a binding agreement, committing Laurelon Terrace to sell the property to Children's and committing Children's to buy the property if the City Council approves the proposed Final Master Plan. ~~Before development of the site could occur, Children's would need to complete the purchase of all units.~~ While ~~most~~ over 80 percent of the owners have expressed a willingness to sell their units through ~~a straw poll of owners~~their signature on the agreement, there are also some residents who would prefer to remain.

Selection of Alternatives 7R or 8 would significantly impact housing by removing 136 moderately-priced housing units from the neighborhood and northeast Seattle unless replacement housing is developed within the same area. Section 23.34.124(7) of the Seattle Municipal Code precludes the expansion of MIO boundaries where *"they would result in the demolition of structures with residential use unless comparable replacement is proposed to maintain the housing stock of the city."* Children's proposed housing replacement package is intended to address the City's policy and program goals for comparable affordable housing and contribute to the replacement of at least 136 housing units in northeast Seattle. ~~Children's has informed the Department of Planning and Development that they plan to work in partnership with public agencies, non-profit organizations, housing developers and neighborhood groups to maximize the opportunities to leverage more affordable housing in northeast Seattle. Children's is proposing to meet their housing replacement responsibilities by contributing to the development of 136 new units of housing in northeast Seattle. To begin this project, Children's has stated that they will contribute to the development of 52 units of housing at Sand Point Magnuson scheduled for groundbreaking in fall of 2009.~~ The approval on whether the proposed replacement housing constitutes "comparable replacement" would be made by the City as part of the Major Institution Master Plan review and approval process~~Seattle City Council~~.

The increased demand for visitor and patient-family housing would be the same as for Alternatives 3 and 6.

3.8.3 Mitigation Measures

If Alternative 7R or 8 is selected and the housing units in Laurelon Terrace demolished, Children's would be required to propose comparable replacement housing to maintain the housing stock of the city. ~~Children's has proposed to contribute to the development of 136 new units of housing in northeast Seattle beginning with a contribution to the development of 52 units of housing at Sand Point Magnuson scheduled for groundbreaking in fall of 2009. The approval on the proposed replacement housing would be made by the Seattle City Council.~~ Children's has informed the City's Office of Housing that it will meet, and to the extent feasible and cost-effective, exceed housing replacement responsibilities for the demolition of Laurelon Terrace.

Children's says it will work with non-profit housing organizations and the City's Office of Housing and DPD to establish a binding agreement for a specific package of replacement housing. The housing replacement package is intended to address the City's policy and program goals for comparable affordable housing and contribute to the replacement of at least 136 housing units in northeast Seattle. They have also said that participation in the development of affordable housing at Sand Point Magnuson will be a component of the agreement. Per the SEPA housing policy codified in SMC 25.05.675 I. Housing, c. *"Compliance with legally valid City ordinance provisions relating to housing relocation, demolition and conversion shall constitute compliance with this housing policy."* The approval on the proposed replacement housing would be made by the City as part of the Major Institution Master Plan review and approval process. If approved, Children's housing replacement package would constitute mitigation for the loss of the Laurelon Terrace housing.

3.8.4 Significant Unavoidable Adverse Impacts

At the time of the 2000 census, there were 649 multi-family units in the Laurelhurst/Sand Point Way CRA and 3,013 multi-family units in northeast Seattle. Multi-family or attached housing provides a more affordable housing option for many of Seattle's residents. Through the loss of 136 units at Laurelon Terrace, Alternative 7R or 8 would reduce the available amount of multi-family housing in the Laurelhurst/Sand Point CRA by approximately 21 percent unless the required comparable housing were proposed to be located within the same CRA. This would be a significant loss of moderately priced housing available in the area that would be difficult to replace. Children's has proposed to contribute to the development of 136 new housing units in northeast Seattle, with a contribution to 52 units at Sand Point Magnuson, located at 7400 Sand Point Way NE in Census Tract 41 which is immediately north of the Laurelhurst/Sand Point CRA. At this time, the proposal has been presented by Children's ~~but has yet to be reviewed~~and is under review by the Office of Housing and the Department of Planning and Development ~~or accepted by the City Council~~. If the proposal is found to be acceptable as a means of maintaining the housing stock of the city, ~~and if the housing is located in northeast Seattle,~~ the impact of the loss of the 136 units at Laurelon Terrace would ~~remain but could be~~ be mitigated and reduced to less than significant.

3.8.5 Secondary and Cumulative Impacts

~~By tentatively agreeing to purchase all of the 136 units in Laurelon Terrace, Children's has already increased the value of the individual units to beyond the point of where the selling point would be considered "moderately priced".~~ With Alternatives 3 or 6, the use of the Laurelon Terrace property would be required to conform to the uses permitted within a multi-family zone. This could include maintaining the existing units, perhaps making the units available as rental units, or redeveloping the property into another use that is permitted within the L-3 zoning. If Alternative 7R or 8 is chosen, the Laurelon Terrace units would be demolished and the land redeveloped for hospital use. This would result in less available housing in the area near Children's unless the required comparable housing were proposed to be located within the same CRA. This could cause prospective buyers and renters to move to other areas in greater Seattle.

The conversion of the Laurelon Terrace property from multi-family to Medical Major Institution would cause the remaining multi-family zoned land across 40th Avenue NE to become a half

block wide zone of multi-family, between commercial property on the west and Medical Major Institution on the west. The effect on the continued availability of these multi-family units is unclear. While there are no known plans to redevelop this property for anything other than the existing multi-family use, the removal of the Laurelon Terrace condominiums could create potential secondary and cumulative impacts by increasing the demand to convert this remaining area of multi-family property to medical or commercial use. If the land were to be rezoned, this could result in the further loss of affordable multi-family housing in this part of Seattle unless ~~new commercial~~future development were to include apartment units~~s housing~~.

3.9 Aesthetics/Light, Glare and Shadows

3.9.1 Affected Environment

3.9.1.1 Aesthetics (Height, Bulk and Scale)

The existing visual environment of Children's consists of multi-story, large-scale, institutional buildings that step up the slope. Buildings are concentrated on the southern part of the site, with a three-story parking garage and utility plant on the northern part of the site. Vegetation at the perimeter and interior of the site is considerable, and screens some of the height and bulk of the buildings from the surrounding area.

The Children's site contrasts with the surrounding visual environment, as it is surrounded by single-family one- to three-story residences, multi-family three- and four-story residences, and open space such as the Burke-Gilman Playground and Laurelhurst Playfield. There are two schools within five blocks of Children's—Laurelhurst Elementary School and The Villa Academy and the St. Bridget Church.

Topography of the site and the surrounding area slopes down to the west and slightly down to the south. There are territorial views and some visibility of the Olympic Mountains from some vantage points. The hillside location makes Children's visually prominent from Sand Point Way NE. Sand Point Park/Beach located at Sand Point Way NE and NE 65th Street is identified as a place of public view protection ~~scenic route~~ in the SMC environmental policies (SMC 25.05.675). Neither the Burke-Gilman Playground nor Laurelhurst Playfield is included in the list of public parks related to the view protection policies (SMC 25.05.675).

Photomontages have been prepared for each of the alternatives from viewpoints surrounding Children's for height and bulk evaluation. For purposes of comparison to the alternatives, the existing views described below are shown in Appendix C, Attachment C-1.

- Viewpoint 1 (Figure A1) shows the view looking east-northeast from the University of Washington E-1 parking lot adjacent to Montlake Boulevard. Children's and surrounding multi-family and commercial buildings along Sand Point Way NE are partially visible in the far distance at the center of the photo.
- Viewpoint 2 (Figure A5) shows the view looking east from the intersection of Sand Point Way NE and NE 45th Street. The top floor or mechanical facilities level of Children's is visible in the middle-ground behind the Springbrook commercial buildings.
- Viewpoint 3 (Figure A9) shows the view looking north from 43rd Avenue NE between NE 43rd and NE 44th Streets. A small portion of the south side of Children's is visible between the vegetation.
- Viewpoint 4 (Figure A13) shows the view looking west from the pedestrian bridge over NE 45th Street at 48th Avenue NE. The mechanical area on the roof of Children's is visible in the background behind the Laurelhurst Elementary School and other neighborhood buildings.

- Viewpoint 5 (Figure A17) shows the view looking west from NE 47th Street at about 45~~8~~th Avenue NE. The top floor and mechanical facilities level of Children's is just visible in the background.
- Viewpoint 6 (Figure A21) shows the view looking south-southwest along 44th Avenue NE near NE 50th Street. The roof of one building of Children's is visible in the background above the vegetation.
- Viewpoint 7 (Figure A25) shows the view looking southeast up Penny Drive from 42nd~~40th~~ Avenue NE at Sand Point Way NE. The lower or western part of the hospital is visible and much of the hospital is screened either by vegetation or due to the topography of the site.
- Viewpoint 8 (Figure A29) shows the view looking east from Sand Point Way NE between 40th Avenue NE and NE 45th Street. One or two stories of Children's is visible in the middle-ground between the vegetation.
- Viewpoint 9 (Figure A33) shows the view looking southwest from Sand Point Way NE 40th Avenue NE and 41st Avenue NE. One story of the Hartmann building is partially visible in the middle-ground between the vegetation.
- Viewpoint 10 (Figure A38) shows the view looking north from Sand Point Way NE at the Springbrook commercial buildings. One story of the Hartmann building is partially visible in the middle-ground between the vegetation.
- Viewpoint 11 (Figure A43) shows the view looking east from NE 48th Street between 37th Avenue NE and 38th Avenue NE. Three to four stories of Children's is partially visible in the background between the vegetation.
- Viewpoint 12 (Figure A48) shows the view looking east from adjacent to the Burke-Gilman Trail between NE 47th Street and NE 48th Street. Vegetation screens the view.
- Viewpoint 13 (Figure A53) shows the view looking east north-east from NE 45th Street just west of 40th Avenue NE. There is minimal visibility of Children's from this view.

3.9.1.2 Light and Glare

Light and glare on and around Children's currently includes sources of building illumination, car headlights, site and street lighting, and signage. A number of the facilities are operated and lighted 24 hours a day. Children's buildings are illuminated and visible from the surrounding area, but site landscaping obscures and block some of the light. The existing buildings have a variety of surfaces and finishes, but are generally of low reflectivity. No highly-reflective materials or surfaces exist on the buildings. Existing reflective glare does not create significant ~~impacts~~effects.

3.9.1.3 Shadows

Existing shadow conditions are created by the location and scale of structures relative to the seasonal pattern of the sun, time of day, and weather. Topography and vegetation also influence shadow patterns. All public parks and schools in Seattle are protected by the SMC to minimize shadow effects (SMC 25.06.675). Within the vicinity of Children's, applicable public spaces would include the Laurelhurst Playfield, Burke-Gilman Playground, and Burke-Gilman Trail.

Existing shadows created by Children's facilities are shown in Appendix C, Attachment C-2.

3.9.2 Impacts

3.9.2.1 Aesthetics

The visual appearance of Children's would be altered with implementation of any of the action alternatives by the proposed buildings becoming taller, denser, and in some cases, wider. However, the new buildings under Alternatives 3 and 6 would not be located any closer to the site edges; the existing buffers would remain. Alternatives 7R and 8 would result in buildings in Laurelon Terrace with buffers described in Section 2 of this EIS. Design of individual buildings would occur with each building permit but it is anticipated that the façade of the buildings would be composed of materials that aesthetically blend in with the existing buildings on campus, e.g., precast/ceramic wall cladding system or glazed aluminum curtainwall system, among others. Building materials for the Hartmann property facilities are unknown at this time.

The relocation of Penny Drive, site utility upgrades and program requirements to accommodate and future development for Alternatives 3 and 6 would result in the need to remove, relocate, and/or replant approximately 225 trees that currently exist on site. Alternatives 7R and 8 would result in the need to remove, relocate and/or replant trees that exist on the Laurelon Terrace site.

Children's is regionally known for its rich horticultural diversity and commitment to the landscape. Children's goal is to preserve as much of the existing plant material (trees and shrubs) as possible. To the extent possible, this preservation would be accomplished by transplanting existing trees and shrubs to temporary locations during construction for re-introduction on site, transplanting existing trees and shrubs to permanent locations on site that are not affected by the construction process, and introducing new plants and trees of appropriate species and size to meet the goals of the project and the requirements of the City of Seattle Landscape Codes (Directors Rules 13-92, 6-2001, 10-2006, and related SMC sections) unless modified by the Master Plan. It is Children's goal that the landscape would fit within the context of the rest of the campus and become a public benefit for the employees, patients, and surrounding neighborhood. Table 3.9-1 describes the various impacts and proposed improvements for the current landscaped buffer around the perimeter of the site.

According to SMC Chapter 25.05, view must be assessed from various public places, including landmarks, public parks, and designated view corridors. No view impact from or to a public park or landmark would be expected as a result of the alternatives. The development would continue to be visible from the Laurelhurst Playground. No identified scenic resources exist or would result in impacts due to the alternatives.

The proposed height, bulk, and scale of buildings within the proposed MIO height limits were computer generated for each of the alternatives. Table 3.9-2 compares each of the alternatives ~~to Alternative 3, the Proposed Alternative~~. Photomontages are located in Appendix C, Attachment C-1. The buildings superimposed on the photos are intended to show the worst-case impacts according to the MIO limits. Since the projects have not been designed, the actual project appearance is unknown. Surfaces, façade articulation, and fenestration would all make the buildings look more consistent with the existing architectural character. The horizontal lines on

the photomontages indicate the number of stories (and potential mechanical equipment area). The views also take into account improvements associated with pending projects that would be included in Alternative 1.

Figure 3.9-1 (rev) shows the proposed building heights of the build alternatives in comparison to existing buildings on Children's campus.

Table 3.9-1
Proposed Landscaping Impacts and Proposed Improvements

Street Frontage	Alternative 1 – No Build	Alternative 3 – ~~Proposed~~South Campus Expansion	Alternative 6 – Modified North Campus Expansion	Alternative 7R – Expanded Boundary, Early Laurelon Development	Alternative 8 – Early Laurelon Development without Hartmann
40th Avenue NE	No change	No change	No change	41st Avenue NE and NE 46th Street would be vacated between Sand Point Way NE and 40th Avenue NE, and street trees and plantings would be placed along the roadway	Same as Alternative 7R
Laurelon Terrace Boundary	No change	Minor impacts from construction; enhanced landscaping and screening	Same as Alternative 3	The MIO and development would include Laurelon Terrace	Same as Alternative 7R
Sand Point Way NE	No change	Existing buffer plants to be removed and replaced	Same as Alternative 3	Existing plants in Laurelon Terrace would be removed and replaced consistent with plantings along an arterial roadway	Same as Alternative 7R
NE 50th Street and NE 45th Street	No change	The 20 foot buffer along NE 50th Street and 75 foot buffer along NE 45th Street would be maintained. Driveways would be fully landscaped and buffered.	~~Same as Alternative 3~~The eastern half of the 20 foot buffer along NE 50th Street would be increased to 75 feet. The 75 foot buffer along NE 45th Street would be maintained. Driveways would be fully landscaped and buffered.	The eastern two-thirds of the 20 foot buffer along NE 50th Street would be increased to 75 feet, and the western third would be increased to 40 feet. The existing 75 foot buffer along NE 45th Street would be maintained, and a 40-foot landscaped buffer proposed along NE 45th Street for the Laurelon Terrace site. Buffer may be	Same as Alternative 7R

Street Frontage	Alternative 1 – No Build	Alternative 3 – ~~Proposed~~South Campus Expansion	Alternative 6 – Modified North Campus Expansion	Alternative 7R – Expanded Boundary, Early Laurelon Development	Alternative 8 – Early Laurelon Development without Hartmann
				enhanced with plants relocated from construction area.	
44th Avenue NE	No change	The existing 40-foot landscaped buffer would be maintained. Minor impacts due to relocation and re-grading of Penny Drive; shoring wall to be put inside buffer to minimize impacts	~~Same as Alternative 3~~The existing 40-foot landscaped buffer would be increased to 75 feet.	~~No change~~ The existing 40-foot landscaped buffer would be increased to 75 feet.	The existing 40-foot landscaped buffer would be increased to 75 feet.
NE 47th Street and 45th Avenue NE	No change	The existing 75-foot ~~Buffer~~ buffer would be maintained and may be enhanced with plants relocated from construction area	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3
Hartmann Site	No change	Existing plants to be removed and replaced; landscaping would meet City requirements	Same as Alternative 3	A 60-foot buffer would be established at northwest corner to protect Redwood tree grove~~Same as Alternative 3~~	No change

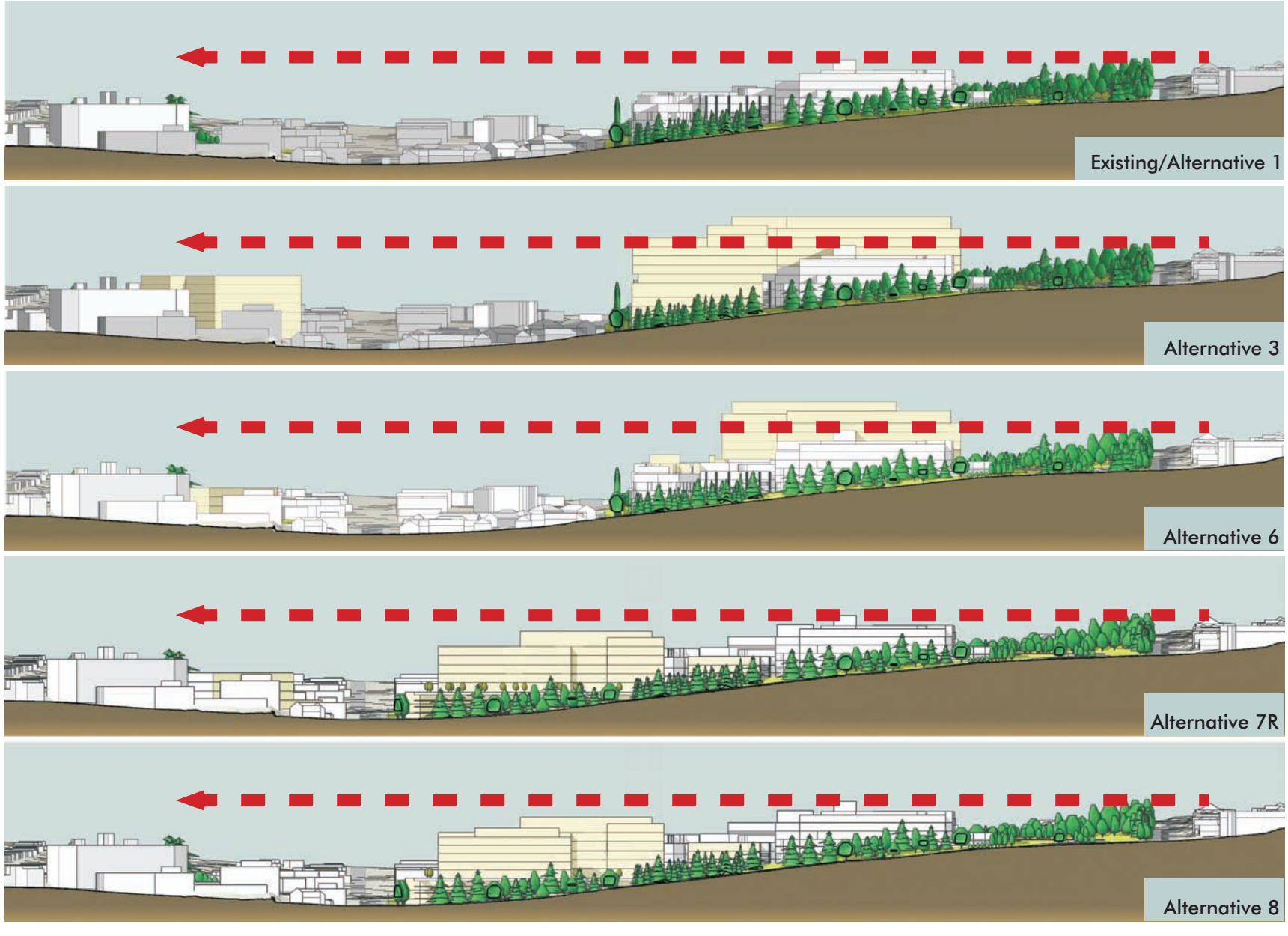
Table 3.9-2
Estimated Height, Bulk and Scale Impacts of the Alternatives

Viewpoint	Alternative 1 – No Build	Alternative 3 – ~~Proposed~~South Campus Expansion	Alternative 6 – Modified North Campus Expansion	Alternative 7R – Expanded Boundary, Early Laurelon Development	Alternative 8 – Early Laurelon Development without Hartmann
Viewpoint 1	Distant background; faintly visible	Upper stories of two buildings visible in the distance; buildings at or above ridgeline	Similar to Alternative 3	Lower and less visible than Alternative 3; tip of ridgeline potentially visible	Same as Alternative 7R

Viewpoint 2	Middle-ground; one story visible	Four to five stories of buildings visible above Springbrook buildings	~~Three~~ Four stories of one bed unit and five stories of a second bed unit visible above Springbrook buildings	Three stories of building visible above and closer to Springbrook buildings	Similar to Alternative 7R; southern most building one story taller than in 7R
Viewpoint 3	Background; partially visible	Three additional stories visible but more distant than the existing building	Slightly lower and less visible than Alternative 3	Same as Alternative 1	Same as Alternative 1
Viewpoint 4	Distant background; mechanical story partially visible	Two to three additional stories partially visible but largely obstructed by existing buildings and vegetation	Slightly lower and less visible than Alternative 3 but without any new structures on the southern part of the property	Same as Alternative 1	Same as Alternative 1
Viewpoint 5	Background; one story partially visible	~~Two~~ Three additional stories plus mechanical visible	~~Similar to~~Same as Alternative 3	Same as Alternative 1	Same as Alternative 1
Viewpoint 6	Background; one story plus mechanical equipment partially visible	Middle-ground; Three stories plus mechanical visible	Middle-ground; ~~Two~~ Three stories plus mechanical visible with a third building partially visible on the northern part of the property	Same as Alternative 1	Same as Alternative 1
Viewpoint 7	Middle-ground; two to three stories visible	Five to six stories of one building and three to four stories of a second building visible	Five to six stories of one building visible in the middle-ground; and ~~two~~ three stories of one building in the near view to ~~left~~east with two stories plus mechanical of a third building visible behind the eastern build	~~Four~~ Five to six stories of one building visible in the middle-ground view to the ~~right~~west, two stories in the middle-ground view in center, and three to four stories of one building in the middle-ground to east	Same as Alternative 7R
Viewpoint 8	Middle-ground; four stories plus mechanical visible of Giraffe building and one story visible on Train building	Four to five stories of two buildings visible behind existing buildings	~~Similar to~~Same as Alternative 3	Fore-ground; ~~Five~~ five stories visible above a three-story base in the near view	Similar to Alternative 7R with exception of southern-most building located further north

Viewpoint 9	Middle-ground; one story partially visible (Hartmann)	Five to six stories of Hartmann visible	Two to three stories of Hartmann partially visible between vegetation	Similar to Alternative 3 at Hartmann; hospital building partially visible in near view to the southeast	Same as Alternative 1 at Hartmann; same as Alternative 7R for hospital area
Viewpoint 10	Middle-ground; one story partially visible (Hartmann)	Seven stories visible at Hartmann	Four stories visible at Hartmann	Four stories visible at Hartmann; hospital building partially visible in distant view	Same as Alternative 1 at Hartmann; same as Alternative 7R for hospital area
Viewpoint 11	Background; three to four stories partially visible between vegetation	Up to seven stories partially visible in background behind existing buildings and vegetation	Up to five stories partially visible in background behind existing buildings and vegetation	Up to five stories partially visible in background. Buildings would appear closer than Alternatives 3 and 6 and not as visible as Alternative 3 to the south	Similar to Alternative 7R
Viewpoint 12	Background; Vegetation screens the view	Three or more stories of Hartmann partially visible in the near to middle-ground between vegetation	Two stories of Hartmann partially visible in the near to middle-ground between vegetation	Similar to Alternative 6; Up to two stories of Hartmann building in middle-ground largely screened behind vegetation	Up to five stories of hospital building in the background largely screened behind vegetation; Hartmann same as Alternative 1
Viewpoint 13	Background; hospital is minimally visible behind vegetation	Up to four stories partially visible above trees in the background	Similar to Alternative 1 in center of the view; two to three stories visible in the background to the north	Up to eight stories visible in middle-ground; four story garage visible in near-ground	Up to eight stories visible in the middle- to near-ground partially over garage

33759484_138.cdr



Source: Zimmer Gunsul Frasca Architects LLP

Figure 3.9-1 rev

Height Comparison of Alternatives

Alternative 1

No mountain or territorial views would be affected. ~~Due to the addition of the proposed bed units on the Train building, part of one story would be visible in viewpoints 2 and 8. The proposed~~Any future additions under the existing Master Plan would be within the existing MIO height limits.

Alternative 3

No mountain or territorial views would be affected from viewpoints ~~2,~~ 3, 5, 6, 7, 8, 9, 10, 11 and 13. Territorial views to the east would be affected from viewpoint 2. Views to the Olympic Mountains and territorial views would be obstructed or partially obstructed from viewpoint 4 by this alternative. The general character of the Sand Point Way and NE 45th Street retail area would not be impacted as building setbacks would keep heights in similar character to existing building bulk and scale.

Alternative 6

Effects would be similar to Alternative 3 but less from viewpoints 2, 3, 4, ~~and~~ 6, 9, 10, 11, 12 and 13.

Alternative 7R

With Alternative 7R, much of the redevelopment would occur on the site of the existing Laurelon Terrace condominiums. The existing MIO heights would remain the same on the eastern portion of the existing campus, and increase from MIO 37 to MIO 50 on the northwest corner. A small portion of the central portion of the campus to the east of the shared property line with Laurelon Terrace would increase from MIO 70 to MIO 90. Because of the location of the new development and the slope down toward Sand Point Way NE, existing views from viewpoints 3, 4, 5 and 6 would not change and would be the same as Alternative 1 (No Build). Effects would be similar to Alternative 3 for viewpoint 1. Effects would be less than Alternative 3 for viewpoints ~~1,~~ 2, ~~and 7,~~9, 10, 11 and 12. Effects would be greater from viewpoints 7, 8 and 13. From viewpoint 8, looking east from Sand Point Way NE between 40th Avenue NE and NE 45th Street, five stories of the new building would be visible in the near view. Views beyond Children's would be obstructed by buildings from viewpoint 8. More building mass would be visible in the middle-ground from viewpoint 13 where existing structures are two stories. Proposed vegetation at the pedestrian level would partially screen the lower stories of the buildings.

Alternative 8

Similar to Alternative 7R, much of the redevelopment with Alternative 8 would occur on the existing Laurelon Terrace site. Because the Hartmann property would not be included in the MIO, the square footage proposed for that site in Alternative 7R, would be placed in the southwest portion of the Laurelon Terrace area. Effects to views would be similar to Alternative 1 for viewpoints 3, 4, 5, 6 and 9 and similar to Alternative 7R for viewpoints 1, 2, 3, 4, 5, 6, 7, 8,

and 11. Effects to views would be slightly greater than Alternative 7R for viewpoint 13. Effects to views would be less than Alternative 7R for viewpoints 9, 10 and 12.

3.9.2.2 Light and Glare

Each alternative would likely generate typical stationary sources of light including interior lighting, pedestrian level lighting (along proposed sidewalks, entryways) and illuminated signs. Interior lighting can be equipped with automatic shut off timers. Where lighting is required for emergency egress, automatic shades can be installed. Specific information relative to stationary building fixtures and signage would be provided as part of the construction-level plans associated with the Building Permit process. At times during the construction period, required area lighting of the job site would be provided, and lighting would be directed away from residences as much as possible.

It is anticipated that the type of glazing that would be specified for the proposed buildings would be similar to Solarban80 (or better products as they come to the marketplace), which is an energy efficient glass in terms of solar heat gain and light transmittance. The glass has a satin reflective finish with an approximate reflectance of 32 percent and a visible light transmission of approximately 47 percent. Glow from site illumination would be minimal primarily because of the landscape buffer, and also due to building design features such as downward-directed lighting and building materials.

Factors that contribute to glare off of buildings include weather, time of day and year, objects that block a light source or reflected light, the reflectivity of materials, and façade orientation. Glare is greatest on clear days during the spring, fall and winter months when the sun's altitude is low on the horizon or below about 30 degrees. This is when incoming rays reflect off windows and surfaces that carry for long distances. In Seattle, the number of clear days with sufficient sunlight to cast shadows and glare average about nine days during the winter months, 16 days during the spring months, and 29 days during summer months, and 17 days during the fall months.

Light and glare from the alternatives is not expected to cause safety hazards. The buffer would continue to block adjacent areas from light and glare. More specific glare analysis will be conducted further into the design process.

3.9.2.3 Shadows

The alternatives were modeled with SketchUp™ software and AutoCAD to determine worst-case scenario shadows for the morning and afternoon hours during the winter and summer months. The analysis evaluates shading associated with the proposed buildings for three times of the day on two key solar days of the year, winter solstice (December 21st) and summer solstice (June 21st). These two days depict the minimum and maximum impacts relative to shadows cast by the alternatives. Shadow-related impacts, however, would occur throughout the year, not only on these two days. A person standing in one location would observe differences in the duration of shadow-related impacts based on season and the width of the shadow.

The shadow analysis for three times of the day on the summer and winter solstice is as follows:

Summer Solstice -- Climatic data indicates that June typically has 19 clear or partly cloudy days.

- At 8:00 am, shadows from the alternatives would extend in a westerly direction and would periodically shade portions of the landscaped area of Children's campus and portions of the Laurelon Terrace property. Alternatives 3 and 6 would have shadows on the Laurelon Terrace property. Alternatives 7R and 8 would have shadows on Sand Point Way NE and 40th Avenue NE.
- At 12:00 pm, shadows would extend the shortest distance during that day and would not extend beyond Children's property (for comparison purposes).
- At 4:00 pm, shadows from the alternatives would extend northeast of the proposed buildings. All shadows from all alternatives would remain on Children's property except for shadows extending onto Sand Point Way NE from the building at Hartmann for Alternative 3.

Winter Solstice -- Although Seattle's December weather typically includes eight clear or partly cloudy days, because of the relatively low altitude of the sun above the horizon at this time of the year[1], (in particular at 9:00 am and 4:00 pm), shadows can be far reaching.

- At 9:00 am, shadows from the alternatives would extend in a northwesterly direction over the existing Children's buildings, a portion of Laurelon Terrace, and Sand Point Way NE. The farthest-reaching shadows would be with Alternative~~s~~ 3~~ and 6~~ to the northwest. Shadows from Alternatives 7R and 8 ~~would not reach as far north or west compared to Alternative 3, and~~ would ~~be~~ reach further south, with Alternative 8 casting shadow onto the Hartmann building. Shadows would extend across Burke-Gilman Trail to the residential area between 38th Avenue NE and 39th Avenue NE from the building at Hartmann with Alternative~~s~~ 3, and less with Alternatives 6 and 7R~~, and not with Alternative 7~~. Alternative 8 does not include development at Hartmann so shadows would not change.
- At 12:00 pm, shadows would carry the shortest distance during that day. The northern-most building on the Laurelon Terrace site for Alternatives 7R and 8 would cast a shadow onto Sand Point Way NE. Alternative 6 would cast a shadow on the residences to the north.
- At 4:00 pm, shadows from the alternatives would extend in a northeasterly direction over the existing surface parking area and onto residences along 44th Avenue NE north of NE 47th Street for Alternatives 3 and 6. ~~No shadows would extend beyond the campus for Alternatives 7 and 8, except from the building at Hartmann.~~ All alternatives would cast some shadow a short distance to the north. Shadows would extend across the first row of buildings facing Sand Point Way NE to the east side of 40th Avenue NE from the building at Hartmann for Alternatives 3, 6, and 7R.

[1] On winter solstice (December 21st), the sun's altitude or angle is approximately 19 degrees at noon. This compares with the sun's altitude on summer solstice (June 21st) when the sun's angle is approximately 66 degrees at noon.

Anticipated shadows that would be created by the alternatives are shown in Appendix C, Attachment C-2. Table 3.9-3 compares the shadow effects of each of the alternatives~~ to Alternative 3, the Proposed Alternative~~.

Table 3.9-3
Estimated Shadow Impacts of the Alternatives[2]

Date/Time	Alternative 1 – No Build	Alternative 3 – ~~Proposed~~South Campus Expansion	Alternative 6 – Modified North Campus Expansion	Alternative 7R – Expanded Boundary, Early Laurelon Development	Alternative 8 – Early Laurelon Development without Hartmann
June 21 8:00 am	No new off-site shadows; existing shadows at eastern edge of Laurelon Terrace	Shadows extend halfway into Laurelon Terrace property to 41st Ave NE; no off-site shadows at Hartmann	Shadows extend to the eastern-most buildings in Laurelon Terrace; no off-site shadows at Hartmann	Shadows extend onto Sand Point Way NE and 40th Avenue NE; no off-site shadows at Hartmann	Same as Alternative 7R
June 21 4:00 pm	No new off-site shadows	No off-site shadows; shadows onto Sand Point Way NE from Hartmann building	No off-site shadows~~; smaller shadows onto Sand Point Way NE from Hartmann building as compared to Alternative 3~~	No off-site shadows~~; smaller shadows onto Sand Point Way NE from Hartmann building as compared to Alternative 3~~	Same as Alternative 1
December 21 9:00 am	No new off-site shadows; existing shadows across Sand Point Way NE	Shadows extend across Laurelon Terrace, Sand Point Way NE, NE 50th St, and south end of Burke-Gilman Playground; shadows extend across Burke-Gilman Trail to residential area between 38th and 39th Ave NE at Hartmann	Shadows extend across Laurelon Terrace, Sand Point Way NE, NE 50th St, and south end of Burke-Gilman Playground; ~~no off-site~~ shadows extend less than Alternative 3 at Hartmann	Shadows extend less than Alternative~~s~~ 3 ~~and 6~~to the northwest; shadows extend further to the south; ~~no off-site~~ shadows extend less than Alternative 3 at Hartmann	Same shadows from main campus as Alternative 7R; no new off-site shadows at Hartmann

[2] Note: To be consistent, some shadow diagrams have been revised so that all diagrams use the same model and without landscaping.

Date/Time	Alternative 1 – No Build	Alternative 3 – ~~Proposed~~South Campus Expansion	Alternative 6 – Modified North Campus Expansion	Alternative 7R – Expanded Boundary, Early Laurelon Development	Alternative 8 – Early Laurelon Development without Hartmann
December 21 4:00 pm	No new off-site shadows; existing shadows at 44th Ave NE and NE 47th Ave	Shadows extend across 44th Ave NE due to two buildings; shadows extend across first row of buildings facing Sand Point Way NE to east side of 40th Ave NE due to Hartmann	Shadows extend across 44th Ave NE due to one building (existing trees along 45th Ave NE would cast a shadow across 45th Ave NE); shadows extend across south bound lane of Sand Point Way NE due to Hartmann	~~No new~~Similar northerly off-site shadows on campus as predicted for Alternative 6; shadows extend across south bound lane of Sand Point Way NE due to Hartmann	Same as Alternative 7 for campus; same as Alternative 1 for Hartmann

3.9.3 Mitigation Measures

During operation, Children's would use a number of measures to reduce or eliminate aesthetic impacts:

- Building facades would be modulated.
- Scale-reducing elements, particularly at areas exposed to people activity (e.g., building entrances, adjacent to walkways, places of high visibility) would be identified and encouraged during project design.
- Pedestrian amenities would be provided as site improvements.
- Landscaping would be provided for pedestrian interest, scale, partial building screening and building contrast.
- Children's would work closely with neighbors to strategically place new trees to fill in gaps and improve views where possible to address specific neighbor concerns.
- Maintenance of the landscaped buffer would continue throughout the life of the project.

During operation, Children's would use a number of measures to reduce or eliminate light and glare impacts:

- Building design would use low-reflective glass and other materials, window recesses and overhangs, and façade modulation.
- The amount of reflective surfaces may be limited.
- Landscaping, screens, and "green walls" may obstruct light from shining to off site locations.
- Nighttime illumination of the site and selected buildings may be restricted and provided only when function or safety requires it.
- Interior lighting would be equipped with automatic shut-off times. Automatic shades may be installed where lighting is required for emergency egress.
- Parking lots and structures may include screens or landscaping to obstruct glare caused by vehicle headlights.
- Lighting fixtures would provide down-lighting or be oriented away from nearby residences.

3.9.4 Significant Unavoidable Adverse Impacts

Hospital

The height, bulk and scale of all Build Alternatives when viewed from Sand Point Way NE (viewpoints 2, 7 and 8), would create significant adverse impacts in comparison to surrounding development. Alternatives 7R and 8, due to their proximity to Sand Point Way NE, would have greater adverse impacts in the immediate vicinity of the Laurelon Terrace site (viewpoints 8 and 13) but would be less or not visible from locations east of the existing hospital campus.

Alternatives 3 and 6 would affect territorial views from the east and would appear larger when viewed from higher elevations to the west. ~~when viewed from the street level at Children's would be a significant unavoidable adverse impact.~~ The anticipated light and glare impacts are not expected to be significant. Buildings proposed for all ~~Alternatives~~ alternatives ~~3 and 6~~ would cast afternoon shadows to the northeast of Children's and Hartmann during the winter months that would impact private residences.

Hartmann

Development alternatives for the Hartmann site include Alternatives 3, 6 and 7R. Building heights would range from 65 feet for Alternatives 6 and 7R to 105 feet for Alternative 3. Foreground or near views from the Burke-Gilman Trail would be blocked by a new building visible behind trees (viewpoint 12); however the building height, bulk and scale would be similar to or less than the existing condominium building to the south, and would not be considered a significant unavoidable adverse impact. The redevelopment of Hartmann proposed under Alternative 3 would cause morning shadows on the Burke-Gilman Trail to the west of Hartmann during the winter months.

3.9.5 Secondary and Cumulative Impacts

Additional shadowing, while a direct impact, also contributes to cumulative loss of perceived open area. There is a potential for an overall increase of lighting and glare in the area. Commercial and residential property owners in the area surrounding Children's are replacing existing small-scale buildings and single family homes. The new buildings and homes tend to have larger footprints and more stories. Cumulative height, bulk and scale effects would be anticipated from the proposed project in conjunction with the redevelopment of the nearby commercial, single family and multi-family lots. ~~No aesthetic or glare secondary or cumulative impacts are expected.~~

PAGE INTENTIONALLY LEFT BLANK

3.10 Transportation

This section analyzes potential effects of the proposed Master Plan on the street system, traffic volumes, traffic operations, traffic safety, parking, non-motorized facilities, and shuttle and transit service in the project area. It describes the future traffic conditions for the year 2030 with and without the approval of the Master Plan. For analysis of Alternative 1, continuation of existing conditions at Children's including the number of beds, building area, employee population, and patient population is assumed. As a result, no change in trip generation, parking demand, or non-motorized and transit facilities are expected.

Traffic generation for Alternatives 3, 6, ~~and~~ 7R, and 8 (the Build Alternatives) is related to the ~~size and~~ number of beds proposed by Children's as well as employee and patient population. Employee and patient population and traffic generation would be similar for each ~~b~~Build ~~a~~Alternative. Table 3.10-1 summarizes key transportation characteristics of the Build Alternatives.

Table 3.10-1
Build Alternatives Key Transportation Characteristics

Characteristic	Alternative 3 – ~~Proposed~~South Campus Development	Alternative 6 – Modified North Campus Expansion	Alternative 7R – Expanded Boundary, Early Laurelon Development	Alternative 8 – Early Laurelon Development Without Hartmann
Properties Affecting Traffic Generation	500 - 600 beds, 2.4 million sf of development (includes Children's and Hartmann)			
Access to Children's	2 Primary Access Points: Penny Drive – full movements and NE 50th Street – right-in/left-out only; Shuttle Access Only: NE 45th Street		3 Primary Access Points: ~~—~~Penny Drive – full movement~~,~~ and two ~~new driveway Sand Point Way NE – right-in/right-out,~~ 40th Avenue NE Access Points – full movement, one serving the Emergency Department/patient drop-off and the other serving the parking area	
Parking[1]	**3,600 total stalls:**			
	2,570 at hospital	2,845 at hospital	1,775~~1,940~~ at hospital	1,887 at hospital
	530 at Hartmann	255 at Hartmann	~~255~~ 225 at Hartmann	0 at Hartmann
	500 off-site parking area			
	0 at Laurelon Terrace		~~905~~ 1,100 at Laurelon Terrace	1,213 at Laurelon Terrace
Traffic Control	New signal~~s~~ at Sand Point Way NE/NE 50th Street		N/A	
	Signal and c~~C~~apacity improvements at Sand Point Way NE/Penny Drive			

Characteristic	Alternative 3 – ~~Proposed~~South Campus Development	Alternative 6 – Modified North Campus Expansion	Alternative 7R – Expanded Boundary, Early Laurelon Development	Alternative 8 – Early Laurelon Development Without Hartmann
Non-Motorized	Additional controlled crossings along Sand Point Way NE Improved ADA access Improved connection to Burke-Gilman Trail			
Shuttle Service[2]	Off-site shuttle arrival area at Giraffe Entrance			

Source: Children's, March 2008
sf = square feet
N/A = Not applicable, no improvements proposed.
1. The total number of parking is the same for all Build Alternatives ~~except Alternative 6~~; however, the location of parking is different.
2. Children's master plan is continuing to be refined at the writing of this document. For Alternatives 7R and 8, Children's may provide shuttle and transit service along Sand Point Way NE at 40th Avenue NE rather than the Giraffe Entrance.

3.10.1 Street System

3.10.1.1 Affected Environment

Regional Street System

Regional access to Children's and the Hartmann site is provided by I-5 to the west and SR 520 to the south. Roadways in the immediate vicinity of Children's consist primarily of residential streets, minor arterials, and principal arterials. Intersections of arterial streets generally have traffic signals while intersections of local access streets are stop controlled.

Figure 3.10-1 shows the overall study area for the analysis, which was determined in recognition of primary travel patterns for Children's traffic. Based on current information, the study area includes the Montlake Boulevard corridor to SR 520 and the NE 45th Street corridor to I-5. The traffic analysis fully encompasses these corridors and includes evaluating 35 study intersections.

Local Streets

Figure 3.10-2 illustrates the street system in the immediate site vicinity. It depicts key access streets, existing traffic control devices, and shuttle/emergency delivery dropoff and pickup locations. The non-motorized components of the current site and the adjacent local streets (including NE 45th Street, NE 47th Street, NE 50th Street, 40th Avenue NE, 44th Avenue NE, and 45th Avenue NE) are discussed later in Section 3.10.6.1.

Children's Access and Circulation

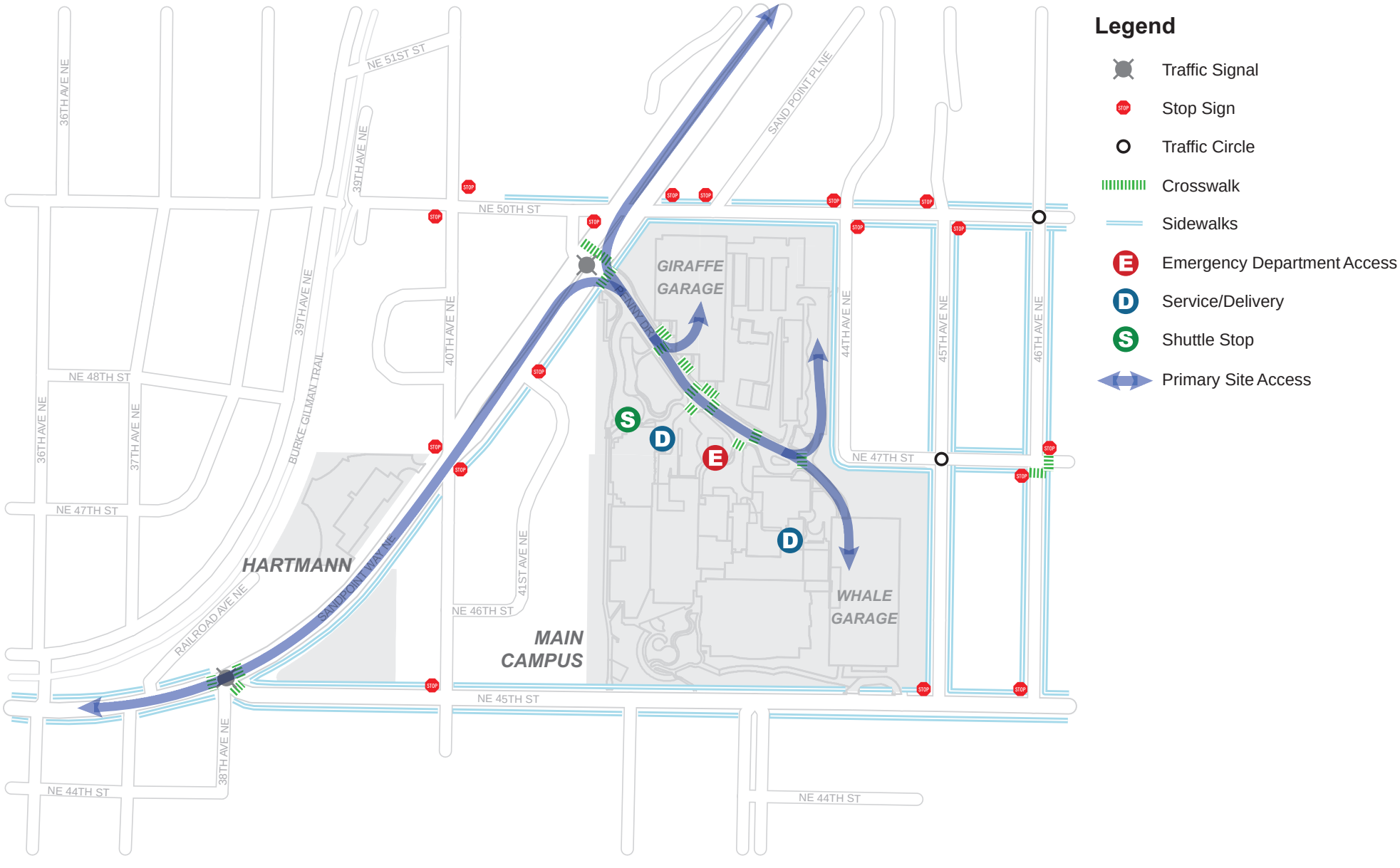
Vehicle Access
Primary access to Children's is provided via the signalized Sand Point Way/Penny Drive intersection which is located approximately 200 feet south of the Sand Point Way NE/NE 50th Street intersection. The inpatient and outpatient facilities are located on the southwest side of Penny Drive. On the northeast side are parking, administrative offices, a plant nursery, and cooling towers. Soon after entering the site, Penny Drive becomes three lanes with multiple points of access to vehicular parking (Giraffe Garage), drop off areas, Children's shuttle stops,

33759484_13.cdr

Source: The Transpo Group

Figure 3.10-1
Study Area and Key Intersections

33759484_14.cdr



Source: The Transpo Group

Figure 3.10-2

Existing Local Street System and Traffic Control

and the emergency department. It culminates at the Whale garage, where patient and visitor parking is provided.

An additional access point exists on NE 45th Street near the southeast corner of Children's. It is currently not used for general traffic; service vehicles can enter the Whale Garage via a secured gate. In addition, an apron at this location allows King County Metro buses to layover on a driveway on Children's property. This driveway also provides access to a fire lane on the south side of the Melinda French Gates Ambulatory Care Building.

Children's owns or leases other sites along Sand Point Way NE (i.e., Hartmann, Springbrook Office Building, and the 70th Avenue NE/Sand Point Way NE office) that are related to hospital operations. The Hartmann property, located at the intersection of 40th Avenue NE and Sand Point Way NE, is proposed for redevelopment as part of the Master Plan. Access to the Hartmann site is provided via two driveways on Sand Point Way NE. One of the driveways is close to the unsignalized Sand Point Way NE/40th Avenue NE intersection.

Emergency Access
The primary access for all vehicles, including emergency vehicles, is via Sand Point Way NE at Penny Drive. The entry to the emergency department is located south of Penny Drive and is accessed at the third driveway. Both emergency vehicles and patients accessing the emergency department enter and exit via the same driveway. In front of the emergency entrance, there are three parking spaces for ambulances, two patient drop-off parking spaces, and four patient parking spaces. In addition, the secondary access along 45th Street NE provides fire vehicle access to the south side of Children's.

Shuttle Access
Currently, Children's shuttles use the signalized Sand Point Way NE/Penny Drive intersection to access the hospital. They drop off and pick up passengers near the Giraffe entrance of the hospital which has a turnaround at the end of a driveway off Penny Drive. Figure 3.10-2 illustrates the location of the shuttle drop off area on campus.

Service and Deliveries
Similar to emergency access, service and deliveries access the hospital via Sand Point Way NE at Penny Drive. Two loading dock areas are provided south of Penny Drive: one for service vehicle access via the second driveway south of Penny Drive at the C-Wing, and one for food delivery access via the third driveway south of Penny Drive at the G-Wing. Figure 3.10-2 illustrates the current location of campus loading docks.

3.10.1.2 Impacts

Alternative 1

Regional Street System
The City's Comprehensive Plan, Capital Improvement Program, *University Area Transportation Action Strategy* (UATAS), and the Washington Department of Transportation (WSDOT) SR 520 Bridge Replacement and HOV Project documents were reviewed to determine transportation policies and planned improvements located within the study area. These planned improvements are detailed in Appendix D, Attachment T-8.

The analysis considers both current conditions and those during the year when all projects would be completed (called the "horizon year"). For this analysis, the horizon year is 2030, and the analysis assumes completion of the University Link Light Rail (which is fully funded), as well as the 35th Avenue NE Improvements and Sand Point Way NE Pedestrian Improvements (between 40th Avenue NE and 41st Avenue NE) under the Capital Improvement Program. The SR 520 project was not included in the analysis because it is not fully funded. If the SR 520 project is implemented, it would increase capacity on SR 520 and may provide additional capacity for the Montlake Boulevard on and off-ramps, which would likely reduce congestion on this portion of the corridor. In addition, the projects outlined in the UATAS were not included in the analysis since they are not funded.

Projects that are currently under review and are not funded were not assumed in the analysis. This assumption presents a conservative estimate of project impacts because many of the improvements would likely reduce congestion along major corridors in the study area.

Local Streets
Under Alternative 1, Children's local access and circulation would be the same as existing except at the Sand Point Way NE/40th Avenue NE intersection. Signalization with a westbound left turn lane on Sand Point Way NE and full pedestrian crosswalks is planned by the City of Seattle in 2009~~8~~.

Alternatives 3, 6, ~~and~~ 7R and 8

Regional Street System
The regional street system for the Build Alternatives would be the same as those described under Alternative 1.

Local Streets
Local access modifications on Sand Point Way NE, NE 50th Street, NE 45th Street are incorporated into the Build Alternatives. Additional modifications are proposed with Alternatives 7R and 8 along 40th Avenue NE and 41st Avenue NE to provide access to the expanded campus on what is now the Laurelon Terrace property. Figures 3.10-3 and 3.10-4 (rev) illustrate the proposed vehicular access and circulation.

These proposed modifications would include:

- **Sand Point Way NE/Penny Drive**. As indicated in the Children's Draft Master Plan (CHRMC 2008), this intersection would be shifted to the north, primarily through widening on the north side of the Penny Drive approach, and re-signalized accordingly. The capacity improvements would include the provision of two outbound left-turn lanes on Penny Drive, and one northbound right turn lane on Sand Point Way NE. Crosswalks would be provided on all approaches, and a pedestrian "scramble" phase would be provided. The pedestrian phase would have minimal impacts on operations with this intersection continuing to operate at an LOS C or better during the peak hours.
- **Sand Point Way NE/NE 50th Street Intersection Improvements.** For Alternatives 3 and 6, the Sand Point Way NE/NE 50th Street intersection would be signalized. Crosswalks would be provided on all approaches of the Sand Point Way NE/NE 50th Street intersection. This traffic signal and associated improvements are only required in

the event that an added access at NE 50th Street is developed which is also part of Alternatives 3 and 6.

- **41st Avenue NE and NE 46th Street Vacations.** With Alternatives 7R and 8, 41st Avenue NE and NE 46th Street would be vacated between Sand Point Way NE and 40th Avenue NE. This roadway currently provides access to residential units; however, with the development of the hospital on this parcel, this roadway would be replaced by building development with access provided at other locations. It is noted that operational and public benefit improvements needed to approve street vacation requests are independent from the environmental review process.
- **Sand Point Way NE Traffic Signal Coordination.** With the two proposed traffic signals, for Alternatives 3 and 6, resulting in a total of four on Sand Point Way NE between NE 45th Street and NE 50th Street, all signals would be coordinated to assure proper progression of traffic volumes on Sand Point Way NE. This improvement would be coordinated with Seattle Department of Transportation (SDOT) and ~~the Washington State Department of Transportation (~~WSDOT~~)~~.

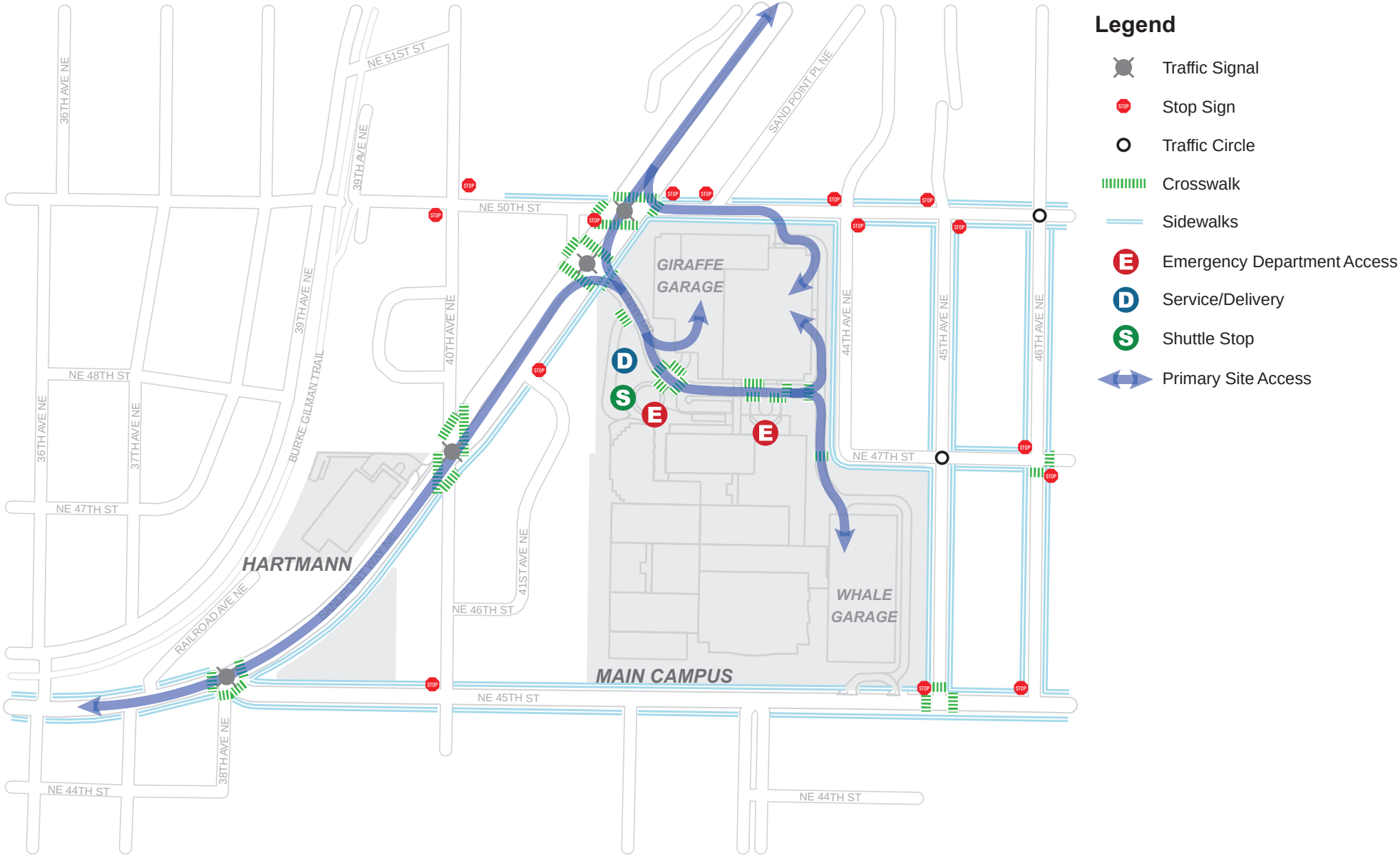
Vehicle Access

In all Build Alternatives, Penny Drive would continue to be the primary access to the campus. It would be supported by secondary access at NE 50th Street in Alternatives 3 and 6. In Alternatives 7R and 8, ~~additional access~~two new access points to the lower expanded campus would be provided off ~~Sand Point Way NE and~~ 40th Avenue NE, in addition to the Penny Drive access. Access to the Hartmann site for Alternatives 3, 6 and 7R would be via a full-access driveway on Sand Point Way NE. The following describes the proposed changes:

- **Sand Point Way NE Access Improvements.** For ~~all Build~~ Alternatives 3, 6 and 7R, this would include developing a full-access driveway on the west side of Sand Point Way NE between NE 45th Street and 40th Avenue NE to serve the Hartmann site. Alternative 8 excludes the use of the Hartmann site ~~and the existing two access points would remain~~; but with the Sand Point Way NE/40th Avenue NE intersection improvements a full-access driveway would be constructed to the southwest. As part of all Build Alternatives, Sand Point Way NE would be improved along the project frontage including sidewalks. Children's would work with SDOT and WSDOT to ensure this driveway design met their standards.

  ~~In addition, Alternative 7 would develop a driveway between 40th Avenue NE and Penny Drive with vehicle access limited to right-in/right-out due to the close proximity to adjacent signalized intersections. An emergency vehicle only left turn lane is proposed, which would require modification to the median, and installation of an emergency vehicle-only signal that would be preempted upon approach of these vehicles. Children's would work with SDOT and WSDOT to ensure this driveway design meets their standards.~~

33759484_105.cdr



Source: The Transpo Group

Figure 3.10-3

Proposed Street System and Traffic Control - Alternatives 3 and 6

33759484_153.cdr

Source: The Transpo Group

Figure 3.10-4 rev

Proposed Street System and Traffic Control - Alternatives 7R and 8

- **NE 50th Street Access Improvements.** For Alternatives 3 and 6, this would include developing a driveway on NE 50th Street and improving NE 50th Street between the driveway and Sand Point Way NE (including sidewalks). The driveway design on NE 50th Street would be such that access would be limited to orient vehicles to the west (no east-oriented inbound or outbound traffic would be allowed to assure that neighborhood traffic impacts would be minimized). This orientation would provide for left-turn out and right-turn in only at the NE 50th Street driveway. Children's would work with SDOT, WSDOT, and the community to determine the appropriate method for restricting these movements. Potential treatments for restricting turns could range from signing to diverter islands or partial closure of NE 50th Street. The NE 50th Street improvements would only be required in the event that an added access at NE 50th Street is developed.
- **NE 45th Street Shuttle Access Improvements.** While not currently used for vehicle access, Children's has maintained a curb cut on NE 45th Street. For all the Build Alternatives, this access location is not planned for vehicle access; however, shuttle-only access is being proposed for Alternatives 3 and 6. ~~Shuttle access at this location would facilitate potential community use of Children's shuttles.~~ This driveway would be designed for left-turn in and right-turn out only. Children's would work with SDOT and the community to determine the appropriate method for restricting turns from this driveway. These improvements would occur only in the event that the NE 45th Street entrance is used as a significant site access location.
- **40th Avenue NE Access Improvements.** For Alternatives 7R and 8, Children's would develop ~~a~~two full access driveways on 40th Avenue NE and improve 40th Avenue NE along the project frontage between NE 45th Street and Sand Point Way NE including sidewalks. In addition, wayfinding signs would be provided along Sand Point Way NE and NE 45th Street to direct Children's traffic to the appropriate driveways.

Emergency Access

For Alternatives 3 and 6, the primary access for all vehicles, including emergency vehicles, at Children's would remain Sand Point Way NE at Penny Drive. Two entrances would be provided off Penny Drive, one for emergency vehicles and one for private vehicles. Secondary emergency vehicle access would be via NE 50th Street.

For Alternatives 7R and 8, the primary access for emergency vehicles would be via 40th Avenue NE.~~an entrance from Sand Point Way NE, proposed as right-in/right-out for general traffic but would provide a left-in from the southbound direction for emergency vehicles only.~~ The~~is~~ Sand Point Way NE/40th Avenue NE intersection traffic signal ~~driveway~~ would be designed with ~~such that only~~ emergency vehicle~~s~~ ~~would~~ preemption ~~a traffic signal~~ to allow ~~left turns into the Sand Point Way NE driveway and no general vehicular traffic~~ safe and quick access to 40th Avenue NE and the emergency department driveway.

~~Children's would work with SDOT and WSDOT to determine the appropriate method for this emergency-only access. General traffic wishing to access the emergency department would use the 40th Avenue NE driveway (from the north or south) or the Sand Point Way NE right-in/right-out access (from the south).~~

Service and Deliveries
The primary campus access for service and deliveries would remain the Sand Point Way NE/ Penny Drive intersection for all alternatives. The two existing service loading areas would be consolidated into one area. Access to the loading area would be via the first driveway on Penny Drive, which would minimize conflicts between service vehicles and the general traffic flow on Penny Drive. Deliveries to the Hartmann site would be via the driveway on Sand Point Way NE. No service and delivery impacts are expected.

Shuttle Access
Primary patterns of ingress and egress for all Children's shuttles would continue to be via the main Penny Drive access. The primary shuttle pick-up and drop-off area for all Build Alternatives would be adjacent to the Giraffe Entrance. The shuttle area would provide a convenient connection to transportation and support Children's increase efforts to encourage or require non-SOV travel and/or use of remote parking areas by employees. As the site design process evolves, it is possible that additional definition of on-site shuttle and alternative travel mode facilities could occur. ~~In this event, it is expected that primary site access for shuttles would continue to be via Penny Drive at the primary signalized site access.~~For Alternatives 7R and 8, a shuttle and transit stop would likely be developed along Sand Point Way NE at 40th Avenue NE.

3.10.2 Traffic Volumes

3.10.2.1 Affected Environment

Transportation to and from the study sites (i.e., Children's campus, off-site parking areas, and Hartmann) were examined from a multi-modal perspective. Existing vehicular trips to and from the study sites were determined based on existing person trips by mode. Table 3.10-2 shows the existing single occupancy vehicle (SOV), transit, bike/walk, and other trips pertaining to the hospital and Hartmann.

Table 3.10-2
Existing Person Trips by Mode

Mode	Daily	AM Peak Hour	PM Peak Hour
SOV	8,600	680	640
Carpool	1,110	230	150
Vanpool	280	80	60
Transit	810	130	100
Bike/walk	660	130	90
Total	**11,460**	**1,250**	**1,040**

Source: The Transpo Group, March 2008

As shown in the table, a majority of the travel occurs via vehicle with transit and bike/walk accounting for about 20 percent of the total person trips during the peak hours and about 15 percent of the total person trips on a daily basis. Appendix D, Attachment T-1 provides additional detail on the travel characteristics and demand of Children's.

Based on the person trips shown in Table 3.10-2, SOV, carpool, and vanpool person trips were converted into vehicle trips considering the average occupancy for each vehicle. Children's generates approximately 9,200 daily vehicle trips, with about 800 trips occurring during the AM peak hour and 720 trips occurring during the PM peak hour[1]. The traffic evaluation focuses on existing vehicle trip generation to and from the hospital, off-site parking, and the Hartmann site. Person trips were used to determine existing vehicle trips, and account for persons who make more than one trip to the sites per day or during the peak hours (e.g., traveling to and from the sites for lunch or a meeting). These figures were calibrated against driveway and shuttle ridership counts.

Study area traffic volume data were compiled to characterize existing weekday traffic conditions during the AM and PM peak hours. Intersection turning movement counts were conducted in October 2007 when the University of Washington was in full session. Figures showing existing traffic volumes at the study intersections during both the AM and PM peak hours are provided in Appendix D, Attachment T-2; intersection turning movement data collection sheets are contained in Appendix D, Attachment T-3.

Depending on the intersection, trips generated by Children's range from less than 5 percent to approximately 50 percent of peak hour traffic volumes. At intersections closer to Children's and along the access corridors, Children's trips represent a larger percentage of overall traffic than at intersections farther from the site.

Approximately 25 percent of the existing Children's traffic uses the Montlake Boulevard corridor to access the campus or the Hartmann site during the peak periods. This traffic generally represents about 10 percent of the existing traffic volumes along Montlake Boulevard during the peak periods. Approximately 25 percent of the existing Children's traffic uses NE 45th Street to access the hospital or the Hartmann site during the peak periods. Children's traffic generally represents approximately 15 percent of the existing traffic along the NE 45th Street corridor during the peak periods.

3.10.2.2 Impacts

Alternative 1

For Alternative 1 (No Build), traffic generated by Children's is assumed to remain the same as existing levels. It was assumed that SOV rates would remain the same as existing. This assumption represents a worst-case scenario, and may somewhat overestimate future Children's traffic levels since they have successfully reduced SOV rates over the past several years. However, over the 23-year forecast horizon, it would be speculative to assume further reduction in SOV levels without enhancements of Children's Transportation Management Program ~~(or Plan)~~(TMP) because ~~since~~ current achieved levels are already consistent with Seattle's central business district TMP performance.

[1] Based on traffic counts conducted in February 2007 at Penny Drive and shuttle ridership information collected at the remote parking areas in October 2007 as well as the calibrated trip generation model.

Alternatives 3, 6, ~~and~~ 7R and 8

Future unmitigated vehicular trips related to the Build Alternatives were determined based on future person trips by mode. Appendix D provides details on the trip generation methodology. Table 3.10-3 shows the total future Children's trip generation and net new trips attributed to the proposed Build Alternatives. The Build Alternatives would increase existing Children's traffic by approximately 8,400 vehicle trips per day, with 850 trips occurring during the AM peak hour and 690 trips occurring during the PM peak hour.

Table 3.10-3
Estimated Future Unmitigated and Mitigated Vehicle Trip Generation

Trips	Unmitigated			Mitigated		
	Inbound	Outbound	Total	Inbound	Outbound	Total
Daily						
Future Total	8,800	8,800	17,600	8,000	8,000	16,000
Existing	4,600	4,600	9,200	4,600	4,600	9,200
Net New	**4,200**	**4,200**	**8,400**	**3,400**	**3,400**	**6,800**
AM Peak						
Future Total	1,210	440	1,650	930	410	1,340
Existing	590	210	800	590	210	800
Net New	**620**	**230**	**850**	**340**	**200**	**540**
PM Peak						
Future Total	420	990	1,410	360	800	1,160
Existing	220	500	720	220	500	720
Net New	**200**	**490**	**690**	**140**	**300**	**440**

Source: The Transpo Group, November 2007

Implementation of the enhanced TMP is anticipated to result in an SOV percentage of about 61 percent for all persons coming to and from Children's during the peak hours, and an overall reduction in net new daily traffic of about 20 percent and ~~during the~~ peak hour traffic~~s~~ of about 30 to 40 percent as compared to the unmitigated traffic generated by the Build Alternatives. This would result in Children's generating approximately 540 net new AM and 440 net new PM peak hour trips due to the expansion. This is approximately 310 AM and 250 PM peak hour trips less than the unmitigated build condition. The remainder of the document focuses on unmitigated conditions in the PM peak hour which represents the worst-case scenario for combined background and Children's traffic.

~~At intersections closer to the hospital and along the access corridors, Children's trips represent a larger percentage of overall traffic than at intersections farther from the site.~~On Montlake Boulevard, traffic from the Build Alternatives would reflect between about 1 and 12 percent of the peak hour traffic at the study intersections, with about 4 percent occurring at the Montlake Boulevard/SR 520 Eastbound ramp intersection during the peak hours. Similarly, ~~build~~ Build

~~alternative~~ Alternative traffic volume impacts would represent between about 3 and 14 percent of the peak hour traffic at the study intersections on NE 45th Street, with about 5 percent occurring near the I-5 interchange. At the intersection of NE 45th Street/Union Bay Place NE (five corners), Children's expansion traffic would reflect approximately 13 percent of the total AM peak hour traffic and 8 percent of the total PM peak hour traffic.

It is recognized that in the future there may be additional pressure for traffic to filter through the Bryant and Laurelhurst neighborhoods, with or without Children's expansion, to avoid congestion on the major corridors. It is not anticipated that a noticeable amount of Children's traffic would travel through the neighborhoods since the cut-through routes would not provide a substantial travel time savings. As a worst-case scenario, this analysis assigned approximately 20 percent of Children's traffic to and from the north on 35th Avenue NE and 40th Avenue NE.

With some variation, traffic volume impacts associated with Children's expansion under the Build Alternatives would be equivalent to or less than the growth in general traffic occurring over the same period.

3.10.3 Traffic Operations

3.10.3.1 Affected Environment

This section reviews current operational conditions at intersections, and along key corridors serving Children's access. The intersection analysis reflects the traditional basis of SEPA review for traffic impacts. The evaluation specifically addresses congested conditions along the Montlake Boulevard and NE 45th Street corridors, which experience delays during peak periods and slow overall progression of traffic.

Intersections

The operational characteristics of intersections are determined by calculating intersection level of service (LOS). The intersection as a whole and its individual turning movements can be described with a range of levels of service (A through F), with LOS A indicating free-flowing traffic and LOS F indicating extreme congestion and long vehicle delays. At signalized and all-way stop controlled intersections, LOS is measured in average total delay per vehicle and is typically reported for the intersection as a whole. At side-street stop controlled intersections, LOS is measured in average movement delay per vehicles and is typically report for the worst movement. Appendix D, Attachment T-5 provides a more detailed explanation of intersection LOS.

Analysis indicates that a majority of the study intersections are operating at LOS D or better during both the AM and PM peak hours. ~~Three~~ Two study intersections, ~~NE 45th Street/Union Bay Place NE ("~~five corners~~"), Montlake Boulevard NE/NE 45th Street,~~ and Montlake Boulevard NE/eastbound SR 520 Ramps, are currently operating at LOS E or worse during one or more peak hours. LOS E or worse indicates that these intersections are congested and vehicle delays are long. Poor operating conditions at the NE 45th Street/Union Bay Place NE intersection are due to a combination of high traffic volumes and the unconventional five-leg configuration of this intersection. The ~~Montlake Boulevard NE/NE 45th Street and~~ Montlake

Boulevard NE/eastbound SR 520 Ramps intersection~~s~~ operates poorly due to high traffic volumes and inadequate capacity during the peak hours (Figure 3.10-5).

Although this evaluation focuses on the AM and PM peak hours, there are excessive delays along the NE 65th Street corridor during non-peak periods, including at the NE 65th Street/25th Avenue NE study intersections[2].

The City of Seattle's Comprehensive Plan does not define a LOS standard for individual intersections; however, the City generally recognizes LOS E and F as poor operations.

Key Corridors

Children's is served by several key corridors within the study area. Travel time and speed surveys were conducted along key corridors to present a more complete picture of the existing study area transportation system. These surveys were conducted during the PM peak period which represents the heaviest traffic flows in the study area. Table 3.10-4 provides a summary of the existing travel times to and from Children's along Montlake Boulevard, NE 45th Street, and Sand Point Way NE.

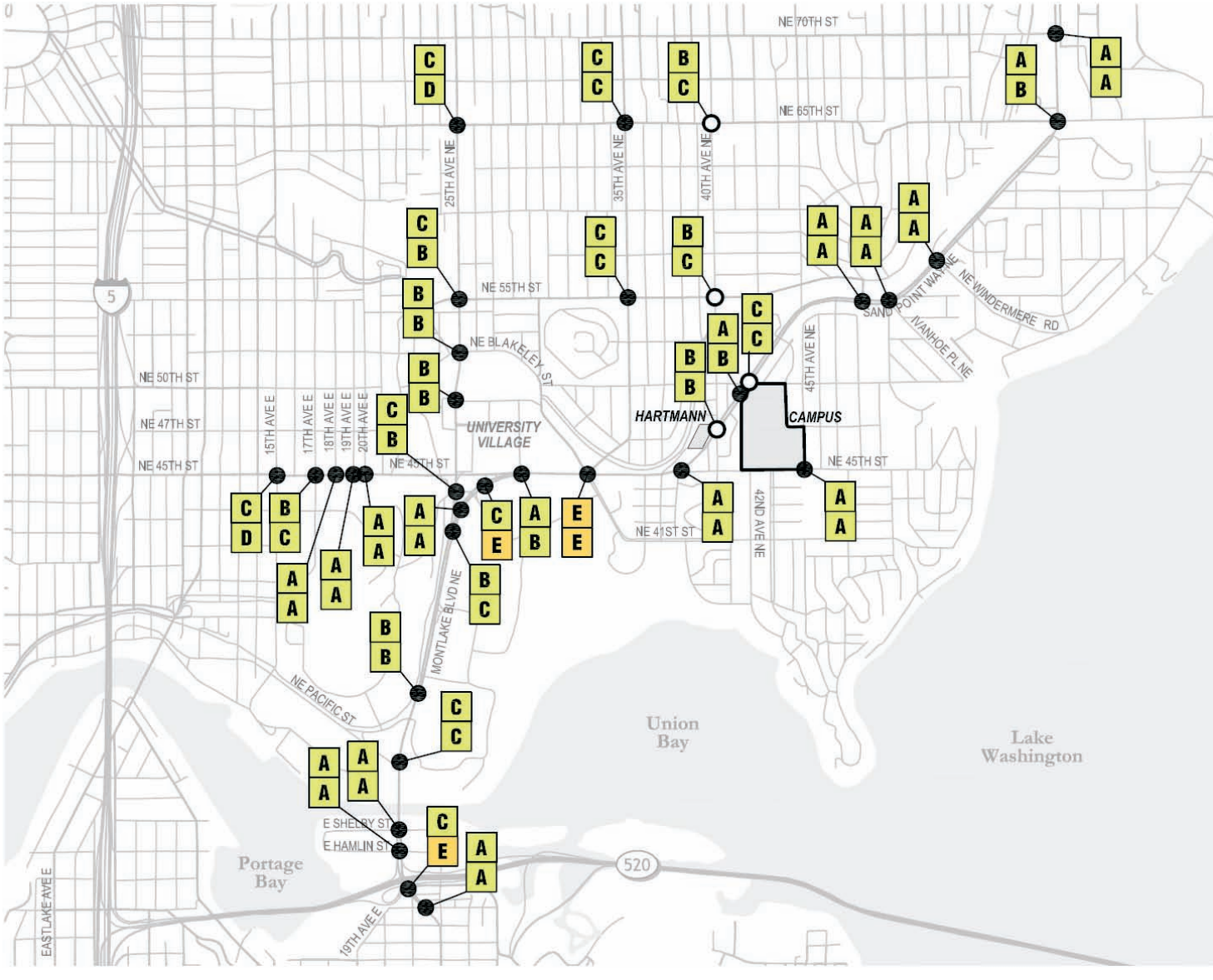
Sand Point Way NE Corridor
As shown in Table 3.10-4, travel to and from the north along Sand Point Way NE currently occurs at nearly the speed limit. This is consistent with the results of the intersection levels of service which show very good LOS B or better operations at all signalized intersections north of Children's during the PM peak hour.

Montlake Boulevard Corridor
During the PM peak hour, the southbound direction travel exhibits greater delay (i.e., longer travel time and slower speeds) than the northbound direction. The primary "bottlenecks" in the southbound direction are five corners, near the hospital, and the approach to SR 520, at the south end of the corridor. While the overall average travel speed was about 10 mph for the Montlake Boulevard corridor, the travel speeds in shorter segments near points of congestion (i.e., five corners and SR 520) is lower. The analysis shows that the overall performance of the Montlake Boulevard corridor is affected by access capacity to SR 520 and regional traffic congestion on SR 520 itself.

NE 45th Street Corridor
NE 45th Street connects with I-5 via the University District business district street grid, where signals and I-5 congestion affect traffic performance congestion. Average travel speeds in both the eastbound and westbound directions along the NE 45th Street corridor are similar during the PM peak hour. The primary "bottleneck" in both directions to and from Children's is from I-5 through the University District and five corners. While the overall average travel speeds were about 13 to 14 mph for the corridor, the travel speeds in short segments near points of congestions (i.e., from I-5 through the University District and five corners) is lower.

[2] Seattle Department of Transportation, *University Area Transportation Action Strategy Final Report*, August 2008

33759484_17.cdr



N

NOT TO SCALE

LEGEND

X = AM
X = PM
● = SIGNALIZED INTERSECTION
○ = UNSIGNALIZED INTERSECTION

SIGNALIZED INTERSECTION LEVEL OF SERVICE SCALE

A = 0 TO 10 DELAY (SEC/VEH)
B = 10 TO 20 DELAY (SEC/VEH)
C = 20 TO 35 DELAY (SEC/VEH)
D = 35 TO 55 DELAY (SEC/VEH)
E = 55 TO 80 DELAY (SEC/VEH)
F = 80+ DELAY (SEC/VEH)

UNSIGNALIZED INTERSECTION LEVEL OF SERVICE SCALE

A = 0 TO 10 DELAY (SEC/VEH)
B = 10 TO 15 DELAY (SEC/VEH)
C = 15 TO 25 DELAY (SEC/VEH)
D = 25 TO 35 DELAY (SEC/VEH)
E = 35 TO 50 DELAY (SEC/VEH)
F = 50+ DELAY (SEC/VEH)

Source: The Transpo Group

Figure 3.10-5
Existing Peak Hour Levels of Service Summary

Table 3.10-4
Existing (2007) PM Peak Hour Corridor Travel Time and Average Speeds

Corridor	Direction[1]	Existing	
		Average Travel Time (minutes)[2]	Average Speed (mph)
Sand Point Way NE between NE 70th Street and Children's	NB	3	32
	SB	3	34
Montlake Boulevard and Sand Point Way NE between Roanoke Street and Children's	NB	9	15
	SB	13	10
NE 45th Street and Sand Point Way NE between I-5 and Children's	WB	9	14
	EB	10	13

Source: The Transpo Group, March 2008
1. Direction of travel where NB = northbound, SB = southbound, EB = eastbound, and WB = westbound.
2. Average travel time presented in minutes.

Site Access

Access to Children's is currently provided via the signalized intersection at Sand Point Way NE and Penny Drive. An evaluation of existing intersection operations during both the AM and PM peak hours shows that the current service level is LOS B or better at this location. These good operations show that one driveway is sufficient to serve the current traffic (i.e., approximately 600 to 650 vehicles) to and from Children's during the peak hours.

Concurrency

Children's currently meets transportation concurrency.

3.10.3.2 Impacts

Impacts to traffic operations describe how the transportation system will perform with and without the Master Plan. This section discusses the operating conditions based on the traditional intersection level of service and performance of key corridors, as a system wide analysis. Together, these analyses provide a basis for decision makers to understand impacts and potential mitigation options.

Alternative 1

Intersections

The following ~~six~~ five study locations would operate at LOS E or worse under ~~no-build~~No Build 2030 conditions during one or more of the peak hours:

- **NE 45th Street/Union Bay Place NE (Five Corners)** – This intersection operates at LOS E during both the AM and PM peak hours under existing conditions. In 2030, ~~NE~~ five corners would operate at LOS E during the AM peak hour and LOS F during the PM peak hour.

- ~~**Montlake Boulevard NE/NE 45th Street** – This intersection operates at LOS E during the PM peak hour under existing conditions and would continue to operate at this level under no-build 2030 conditions.~~
- **Montlake Boulevard NE/Eastbound SR 520 Ramp** – This intersection operates at LOS E during the PM peak hour under existing conditions and would continue to operate at this level under ~~no-build~~No Build 2030 conditions.
- **25th Avenue NE/University Village Driveway** – Operations at this intersection would degrade from LOS B under existing conditions to LOS E under ~~no-build~~No Build 2030 conditions during the PM peak hour.
- **40th Avenue NE/NE 55th Street** – Operations at this intersection would degrade from LOS C under existing conditions to LOS F in ~~no-build~~No Build 2030 conditions during the PM peak hour. This intersection would meet the *Manual on Uniform Traffic Control Devices* (MUTCD) traffic signal warrant criteria (FWHA 2003).
- **40th Avenue NE/NE 65th Street** – Operations at this intersection would degrade from LOS C under existing conditions to LOS E in ~~no-build~~No Build 2030 conditions during the PM peak hour. The poor operating conditions are due to high traffic volumes on the northbound approach; all other approaches would operate at LOS D. This intersection would meet the criteria in the MUTCD for traffic signal warrants (FWHA 2003).

All other study intersections are expected to operate at LOS D or better under ~~no-build~~No Build 2030 conditions during both the AM and PM peak hours**.**

Key Corridors

PM peak hour average travel times and speeds along key corridors were estimated for the 2030 No Build and Build Alternatives using the Synchro 6.0 software program which was calibrated against existing data. In the future, the PM peak hour would continue to represent the heaviest traffic flows in the study area. Table 3.10-5 provides a summary of No Build and Build Alternatives travel times to and from Children's along the key corridors with the existing and enhanced TMP. Existing travel times are shown for comparison purposes.

Sand Point Way NE Corridor. As would be expected with an increase in traffic volumes, travel times along the Sand Point Way NE corridor to and from NE 70th Street and Children's would increase from 2007 to 2030. The average speed would be approximately six to seven mph below the speed limit.

Montlake Boulevard Corridor. Similar to existing conditions, during the PM peak hour the southbound direction travel would continue to exhibit greater delay (i.e., longer travel times and slower speeds) than the northbound direction. As compared to existing conditions, under No Build conditions, travel times would increase along the Montlake Boulevard corridor by approximately ~~one~~ two minutes in the northbound direction and ~~five~~ one minute~~s~~ in the ~~more congested~~ southbound direction.

Table 3.10-5
Comparison of Existing, No Build (2030), and Build Alternatives Corridor Travel Time and Average Speeds

Corridor	Direction[1]	Existing		No Build (2030)		Build Alternatives w/ Existing TMP (2030)		Build Alternatives w/ Enhanced TMP (2030)	
		Average Travel Time (minutes)[2]	Average Speed (mph)	Average Travel Time (minutes)[2]	Average Speed (mph)	Average Travel Time (minutes)[2]	Average Speed (mph)	Average Travel Time (minutes)[2]	Average Speed (mph)
Sand Point Way NE between NE 70th Street and Children's	NB	3	32	3	27	3	24	3	26
	SB	3	34	3	28	3	27	3	26
Montlake Boulevard and Sand Point Way NE between Roanoke Street and Children's	NB	9	15	~~10~~11	11	11	10	11	10
	SB	13	10	~~18~~14	~~6~~8	~~21~~16	~~6~~7	15	8
NE 45th Street and Sand Point Way NE between I-5 and Children's	WB	9	14	10	12	13	9	11	10
	EB	10	13	12	10	15	8	14	8

Source: The Transpo Group, March 2008
1. Direction of travel where NB = northbound, SB = southbound, EB = eastbound, and WB = westbound.
2. Average travel time presented in minutes.

NE 45th Street Corridor. Similar to existing conditions, the average travel speeds during the PM peak hour in both the eastbound and westbound directions would continue to be approximately the same under No Build conditions. A comparison between existing and No Build conditions shows that travel times would increase by about one minute in the westbound direction and two minutes in the eastbound direction.

~~The first three~~ Two affected intersection~~ locations~~s (i.e., five corners~~, Montlake Boulevard NE/NE 45th Street,~~ and Montlake Boulevard/Eastbound SR 520 Ramps) ~~all~~ have limited opportunities to support general traffic capacity improvements. In these cases, it may be more appropriate to consider system improvements that support non-SOV travel mode choices, such as HOV lanes, or pedestrian/bicycle improvements. These issues have been studied in a number of previous documents, most recently the ~~UATS~~UATAS and the SR 520 project review. Improvements identified thus far include:

- Montlake Boulevard HOV lanes (widening)
- Transit bypass lanes and transit priority on NE 45th Street
- NE 45th Street/I-5 capacity improvements
- Optimization of traffic signals for the Sand Point Way NE/NE 45th Street/Montlake Boulevard corridor
- Variable Message Signs (VMS)

As part of this analysis additional capacity improvements at critical intersections such as five corners were also evaluated. However, major street widening and even a roundabout, while theoretically adding capacity and improving intersection performance, do not appear to be either practical or feasible. Similarly, capacity improvements on Montlake Boulevard near SR 520 or the Montlake Bridge, as well as on NE 45th Street through the University District would appear to be difficult.

Site Access

Access for Children's under Alternative 1 would continue to be via one driveway at the Sand Point Way NE/Penny Drive intersection. Similar to existing conditions, this intersection is anticipated to have good operations with a service level of LOS B or better during the peak hours.

Alternatives 3, 6, ~~and~~ 7R and 8

Intersections

Impacts of the Build Alternatives, compared to Alternative 1, are considered potentially significant by the City if the:

- Intersection level of service degrades from an acceptable LOS D to LOS E or worse
- Intersection level of service degrades from an unacceptable LOS E to LOS F
- Intersection delay increases by more than five seconds at an intersection already operating at LOS E or worse without project traffic

Based on these criteria, the ~~five~~ four intersections shown in Table 3.10-6 would be most affected by the addition of Children's new traffic in 2030. Table 3.10-6 compares the potential impacts to intersections due to the Build Alternatives with the existing and proposed enhanced TMP. The No Build conditions are shown for comparison.

The 25th Avenue NE/University Village Driveway intersection would continue to operate at LOS E with the addition of Children's traffic in 2030. However, the overall intersection delay at the 25th Avenue NE/University Village Driveway intersection would not increase and would not be noticeable to drivers. All other study intersections would operate at LOS D or better during both the AM and PM peak hours.

Key Corridors

Sand Point Way NE Corridor. Travel along the Sand Point Way NE corridor with the proposed expansion would be similar to conditions without the expansions. All the Build Alternatives would decrease travel speeds along the corridor by one to three mph; however, the small changes in speed would likely not be noticeable to drivers. The travel time to and from Children's would be approximately the same with the addition of Children's traffic due to the expansion. This is consistent with the results of the intersection levels of service which show little to no change in operations between the No Build and Build Alternatives for intersection operations along this corridor.

Montlake Boulevard Corridor. The additional traffic due to the Build Alternatives would increase travel times along the Montlake corridor by approximately ~~three~~ two minutes in the southbound direction ~~and one minute in the northbound direction~~. In the critical southbound direction, a ~~three~~ two minute increase is equivalent to a 14~~6~~ percent change in overall travel time. Travel speeds would decline commensurate with added delay between the No Build and Build Alternatives. This is consistent with the results of the intersection analysis which show the majority of the intersections service levels along this corridor would remain the same between the No Build and Build Alternatives. The enhanced TMP proposed by Children's would decrease travel times along this corridor in the southbound direction by about one minute or six percent.

NE 45th Street Corridor. The additional traffic due to the Build Alternatives would increase travel times along the NE 45th Street corridor by approximately three minutes in both directions. This is consistent with the results of the intersection levels of service which show intersection operations at "bottleneck" locations (i.e., I-5 and five corners) would worsen which contributes to the increase in travel time to and from Children's. The enhanced TMP proposed by Children's would decrease travel times along this corridor in the westbound direction by about two minutes or 15 percent and in the eastbound direction by about one minute or seven percent.

Potential mitigation for Children's impact would be similar to those described for the No Build alternative. As discussed for Alternative 1, previous studies have identified a number of projects to increase corridor (and intersection) performance in both the NE 45th Street and Montlake Boulevard corridors. Most of the projects are focused on improving corridor efficiency, enhancing performance and capacity of non-SOV travel modes, and improving driver information and decision making abilities. These projects are all consistent with current City policy direction to emphasize enhancement of non-SOV travel options, which increase the

Table 3.10-6
Summary Comparison of Intersection Impacts

Intersection	No Build Alternative	Build Alternatives Existing TMP			Build Alternatives Enhanced TMP		
	Delay (seconds)	% PM Volume Impact	Delay (seconds)	Delay Increase[1] (seconds)	% PM Volume Impact	Delay (seconds)	Delay Increase[1] (seconds)
Five Corners	137	8%	191	54	6%	171	34
Montlake Blvd/SR 520 EB Ramp	63	4%	75	12	3%	70	7
40th Ave NE/NE 55th St	58	9%	112	54	6%	90	32
40th Ave NE/NE 65th St	42	6%	58	16	4%	51	9

Source: The Transpo Group, March 2008
1. Delay increase represents the increase over the No Build Alternative i.e., Build Alternative delay minus No Build Alternative delay (in seconds).

person-carrying capacity of the system without necessarily increasing vehicular capacity. As noted, ~~no funding for~~ these projects ~~has been secured~~have yet to be fully funded. In addition, Children's proposed TMP enhancements would reduce travel times along these corridors by reducing Children's SOV trips during the peak hours.

Past studies have identified a ~~Given both the~~ baseline level of need ~~identified in the past studies~~in the study area. The traffic operations analysis shows that the Build Alternatives would have some ~~, and the~~ level of impact which should be mitigated. ~~suggested by the Build Alternatives analysis, additional examination of corridor improvements is needed.~~ Children's participation in funding a portion of ~~these~~ projects identified in the UATAS as well as other studies conducted within the study area ~~may be~~would be appropriate for the City to consider in determining mitigation measures. In addition to the improvements outlined in these studies, Children's could contribute to Intelligent Transportation System (ITS) improvements from Montlake Boulevard/NE 45th Street to the Sand Point Way NE/NE 50th Street intersection to improve vehicle flow and travel times.

To reduce the impact of the expansion, Children's is planning to enhance their existing TMP in order to reduce total traffic, and SOV trips in particular, as shown in Section 3.10.10.2. Appendix D, Attachment T-4 provides the results of the intersection operations analysis with a 30 to 40 percent reduction in build alternative traffic volumes due to the enhanced TMP. Although this mitigation would lessen the affect of the Children's expansion on the delay at the study intersections, it would not eliminate the impacts.

Similar to Alternative 1, other intersection improvements include:

- ~~**Montlake Boulevard NE/NE 45th Street** – Provision of future signal timing adjustments at this location would improve operations to LOS D during the PM peak hour.~~
- **40th Avenue NE/NE 55th Street** –A potential future improvement would be to install traffic signals at this location to improve operations to LOS A during the AM peak hour and LOS B during the PM peak hour.
- **40th Avenue NE/NE 65th Street** –A potential future improvement would be to install traffic signals at this location to improve operations to LOS A during the AM peak hour and LOS B during the PM peak hour.

Site Access

For Alternatives 3 and 6, the proposed access would be via the existing Penny Drive signal (expanded and shifted to accommodate the proposed configuration) plus a new NE 50th Street access, which would be designed to reduce or eliminate any driveway traffic turning to or from the east. Installation of this access would also require installation of a new signal at the Sand Point Way NE/NE 50th Street intersection. For Alternatives 7R and 8, which include~~s~~ the expanded campus to the west, additional access via 40th Avenue NE ~~and Sand Point Way NE~~ is proposed. Alternatives 7R and 8 would not include the NE 50th Street driveway; however, for completeness of the site access evaluation, consideration was given to operations both with and without it for all Build Alternatives.

The adequacy of Penny Drive was evaluated based on operations of the access point (i.e., LOS D or better), vehicle queues along the driveway which may block parking garage entrances and increase congestion on the circulation roads, and the interaction of pedestrians and vehicles on-site to ensure safety. Based on these criteria, access needs for the upper campus (i.e., existing campus not including expansion to Laurelon Terrace) are as follows:

- **Penny Drive Only (One Driveway) –** This access would serve up to approximately 1,000 total peak hour vehicle trips.
- **Penny Drive and NE 50th Street (Two Driveways)** – Two accesses would serve up to approximately 1,500 total peak hour vehicle trips.

Based on these factors, a total of 1,000 peak hour vehicle trips could be accommodate by the Penny Drive signalized access. With an additional access onto NE 50th Street, up to 1,500 peak hour vehicle trips could be handled. Table 3.10-7 illustrates the level of usage of the upper campus, and the access requirements for each build alternative.

Table 3.10-7
Build Alternatives Access Requirement Summary

	Alternative 3	Alternative 6	Alternative 7R	Alternative 8
Access Capacity				
Penny Drive Only	1,000			
Penny Drive and NE 50th Street	1,500			
Access Demand Volumes (Upper Campus Only)				
AM Peak Hour Vehicle Trips	1,160	1,320	~~900~~830	860
PM Peak Hour Vehicle Trips	990	1,120	~~770~~710	730
Number of Required Accesses (Upper Campus Only)				
AM Peak Hour Requirement	2	2	1	1
PM Peak Hour Requirement	1	2	1	1

Source: The Transpo Group, March 2008.

As shown in Table 3.10-7, Alternatives 3 and 6 would require two access points to serve the level of anticipated traffic associated with the upper campus traffic demand. This traffic demand relates to the proposed parking demand on the upper campus. For Alternative 3, which proposes 2,570 on-site parking spaces, demand exceeds the capacity of the "Penny Drive only" access by about 16 percent. For Alternative 6, which proposes 2,845 on-site spaces, access demand exceeds the Penny Drive capacity by over 30 percent. With Alternatives 7R and 8, both the AM

and PM peak hour traffic volumes for the upper campus could be served by Penny Drive only, eliminating the need for the NE 50th Street access.

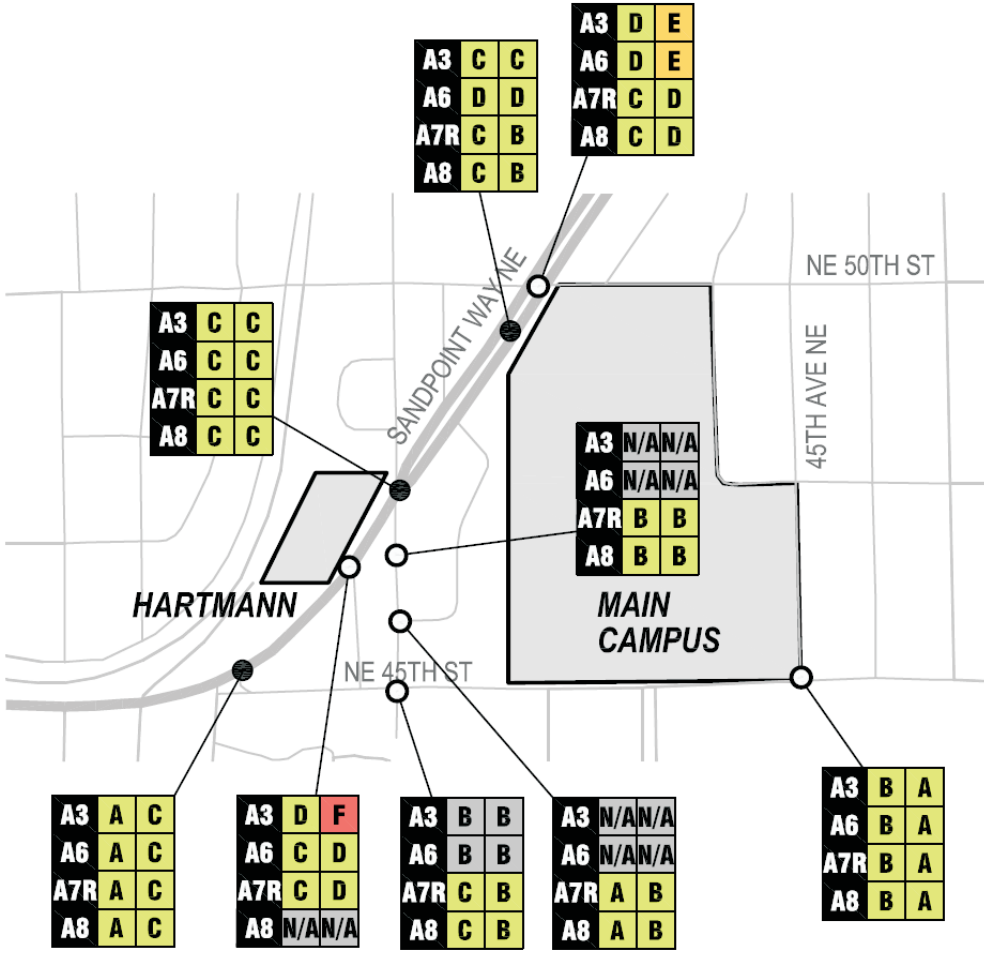
It is noted that if the amount of parking provided on the upper campus was used such that expected peak hour traffic volumes were 1,000 vehicles or less for Alternatives 3 and 6, then the Penny Drive access would be sufficient and the NE 50th Street access could be eliminated.

To provide decision-makers with an understanding of the operational affects of near-site intersections and on-site circulation, a sensitivity analysis was conducted, which evaluated each alternative both with and without NE 50th Street. Figures 3.10-6 (rev) and 3.10-6a present the results of the intersection operations for all the scenarios. Operation at all of the intersections would operate at LOS D or better during both peak hours both without and with NE 50th Street except the following:

- For Alternative 3, unsignalized left-turns from the Hartmann driveway would operate at LOS F during the PM peak hour, with or without the NE 50th Street access. This is due to approximately 60 left-turning vehicles from Penny Drive. It may be desirable to design the driveway with dual outbound lanes to assure right-turn exiting vehicles are not delayed by the left-turning vehicles. It is noted that with a reduction in parking on the Hartmann site, as shown by the analysis of Alternatives 6 and 7R, this driveway would operate at LOS D or better during the peak hours.
- For Alternatives 3 and 6, the Sand Point Way NE/NE 50th Street intersection would operate at LOS E during the PM peak hour without the NE 50th Street access. This intersection would not be signalized without the proposed NE 50th Street access.

Under Alternatives 3 and 6, without the NE 50th Street access, Children's would not signalize the Sand Point Way NE/NE 50th Street intersection. However, the analysis shows poor operations at this intersection. In the case that the NE 50th Street access is not provided for Alternatives 3 and 6, it is recommend that traffic be monitored at the Sand Point Way NE/NE 50th Street intersection to determine whether the need for a traffic signal develops. ~~Therefore, i~~In terms of intersection operations, either access proposal would have minimal impact on the adjacent street system.

33759484_161.cdr



N

NOT TO SCALE

LEGEND

ALTERNATIVE AM PM

A#	X	X

● = SIGNALIZED INTERSECTION

○ = UNSIGNALIZED INTERSECTION

N/A = NOT APPLICABLE (NO ACCESS PROPOSED)

SIGNALIZED INTERSECTION LEVEL OF SERVICE SCALE

A	= 0 TO 10 DELAY (SEC/VEH)
B	= 10 TO 20 DELAY (SEC/VEH)
C	= 20 TO 35 DELAY (SEC/VEH)
D	= 35 TO 55 DELAY (SEC/VEH)
E	= 55 TO 80 DELAY (SEC/VEH)
F	= 80+ DELAY (SEC/VEH)

UNSIGNALIZED INTERSECTION LEVEL OF SERVICE SCALE

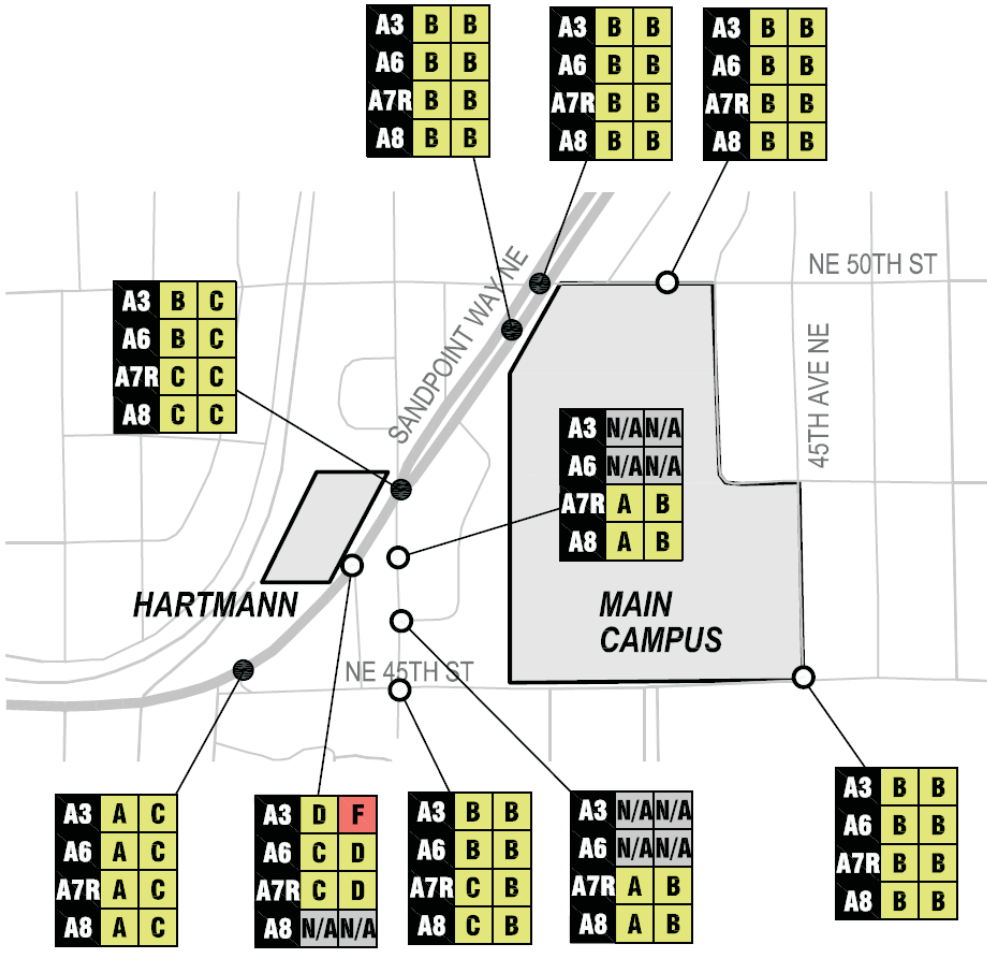
A	= 0 TO 10 DELAY (SEC/VEH)
B	= 10 TO 15 DELAY (SEC/VEH)
C	= 15 TO 25 DELAY (SEC/VEH)
D	= 25 TO 35 DELAY (SEC/VEH)
E	= 35 TO 50 DELAY (SEC/VEH)
F	= 50+ DELAY (SEC/VEH)

Source: The Transpo Group

Figure 3.10-6 rev

Build Alternatives Peak Hour Levels of Service Summary without NE 50th Street Access

33759484_164.cdr



NOT TO SCALE

LEGEND

ALTERNATIVE AM PM

A#	X	X

● = SIGNALIZED INTERSECTION

○ = UNSIGNALIZED INTERSECTION

N/A = NOT APPLICABLE (NO ACCESS PROPOSED)

SIGNALIZED INTERSECTION LEVEL OF SERVICE SCALE

A	= 0 TO 10 DELAY (SEC/VEH)
B	= 10 TO 20 DELAY (SEC/VEH)
C	= 20 TO 35 DELAY (SEC/VEH)
D	= 35 TO 55 DELAY (SEC/VEH)
E	= 55 TO 80 DELAY (SEC/VEH)
F	= 80+ DELAY (SEC/VEH)

UNSIGNALIZED INTERSECTION LEVEL OF SERVICE SCALE

A	= 0 TO 10 DELAY (SEC/VEH)
B	= 10 TO 15 DELAY (SEC/VEH)
C	= 15 TO 25 DELAY (SEC/VEH)
D	= 25 TO 35 DELAY (SEC/VEH)
E	= 35 TO 50 DELAY (SEC/VEH)
F	= 50+ DELAY (SEC/VEH)

Source: The Transpo Group

Figure 3.10-6a

Build Alternatives Peak Hour Levels of Service Summary with NE 50th Street Access

Transportation Concurrency Review

The City has implemented a Transportation Concurrency Project Review System to comply with one of the requirements of the Washington State Growth Management Act. The system, as described in the Seattle Department of Planning and Development Director's Rule 4-99 and the City's Land Use and Zoning Code, is designed to provide a mechanism that would determine whether adequate transportation facilities would be available "concurrent" with proposed development projects. Transportation concurrency is applied during zoning review of individual projects. The calculation of concurrency herein assumes the entire project would be developed at once, which is not anticipated but represents a worst-case way to present the concept of concurrency (Appendix D).

The transportation concurrency analysis indicates that the Build Alternatives would meet concurrency requirements.

3.10.4 Traffic Safety

3.10.4.1 Affected Environment

Regional

Records of reported accidents at the study intersections were reviewed to help identify whether any traffic safety issues exist. The City of Seattle has adopted criteria for assigning high accident location status to signalized intersections with 10 or more reported collisions per year and unsignalized intersections with five or more reported collisions per year. Fewer than 10 collisions per year were reported at each of the signalized intersections and fewer than five collisions per year were reported each unsignalized study intersections. Thus, none of the study locations currently meet the City's criteria for a high accident location.

The greatest number of collisions was reported at the NE 45th Street/University Village Driveway intersection. At this location, there were 11 accidents in 2004, 15 in 2005, and none in 2006. This sharp reduction in reported collisions corresponds approximately with the installation of traffic signals at this location in 2006.

Local

A review of accidents and safety conditions on the streets local to the Children's campus was also undertaken. This review includes not only an examination of reported accidents, but also consideration of physical conditions that contribute to a safe environment for vehicles, pedestrians, and other travel modes. Eleven locations were identified with eight locations having an average of less than one accident per year for the three year period of 2004 through 2006 (most recent available data). There were an average of four reported accidents each year at the intersection of Sand Point Way NE and Penny Drive and at the intersection of Sand Point Way and NE 50th Street, and 1.3 reported accidents each year at the intersection of 38th Avenue NE and NE 45th Street.

3.10.4.2 Impacts

Alternative 1

In general, as traffic volumes increase, the potential for traffic safety issues increases proportionately. It is unlikely that the increase in traffic would significantly change traffic safety within the study area. However, it would likely become progressively more challenging for side-street traffic at unsignalized intersections to enter the traffic stream. Pedestrian and bicyclists would continue to face the same challenges as today with limited crossings along Sand Point Way NE in the vicinity of Children's. The proposed traffic signal at the Sand Point Way NE/40th Avenue NE intersection would improve vehicular and non-motorized access to and across Sand Point Way NE.

Alternatives 3, 6, ~~and 7~~7R and 8

Regional
Based on the three-year accident history, the study area has not experienced an unusually high level of accidents to date. As traffic volumes increase, the potential for traffic safety issues increases proportionately. It is unlikely that the increase in traffic would significantly change traffic safety within the study area. However, as with the No Build Alternative, it would likely become progressively more challenging for side-street traffic at unsignalized intersections to enter the traffic stream.

Local
With the proposed improvements along Sand Point Way NE including additional signalized crossings, safety associated with pedestrians and bicyclists crossings would be improved. However, additional curb cuts along ~~Sand Point Way NE,~~ NE 50th Street for Alternative 3 or 6, and 40th Avenue NE for Alternative 7R or 8, would increase the potential for vehicle conflicts; no unusual physical conditions exist that would suggest unique safety concerns.

Two schools (Laurelhurst Elementary School and The Villa Academy) are located east of Children's in the Laurelhurst neighborhood, and pedestrian activity near these locations is high during school hours. Nearly all Children's traffic would be oriented to and from the west; therefore, development of the Build Alternatives is not expected to degrade pedestrian safety.

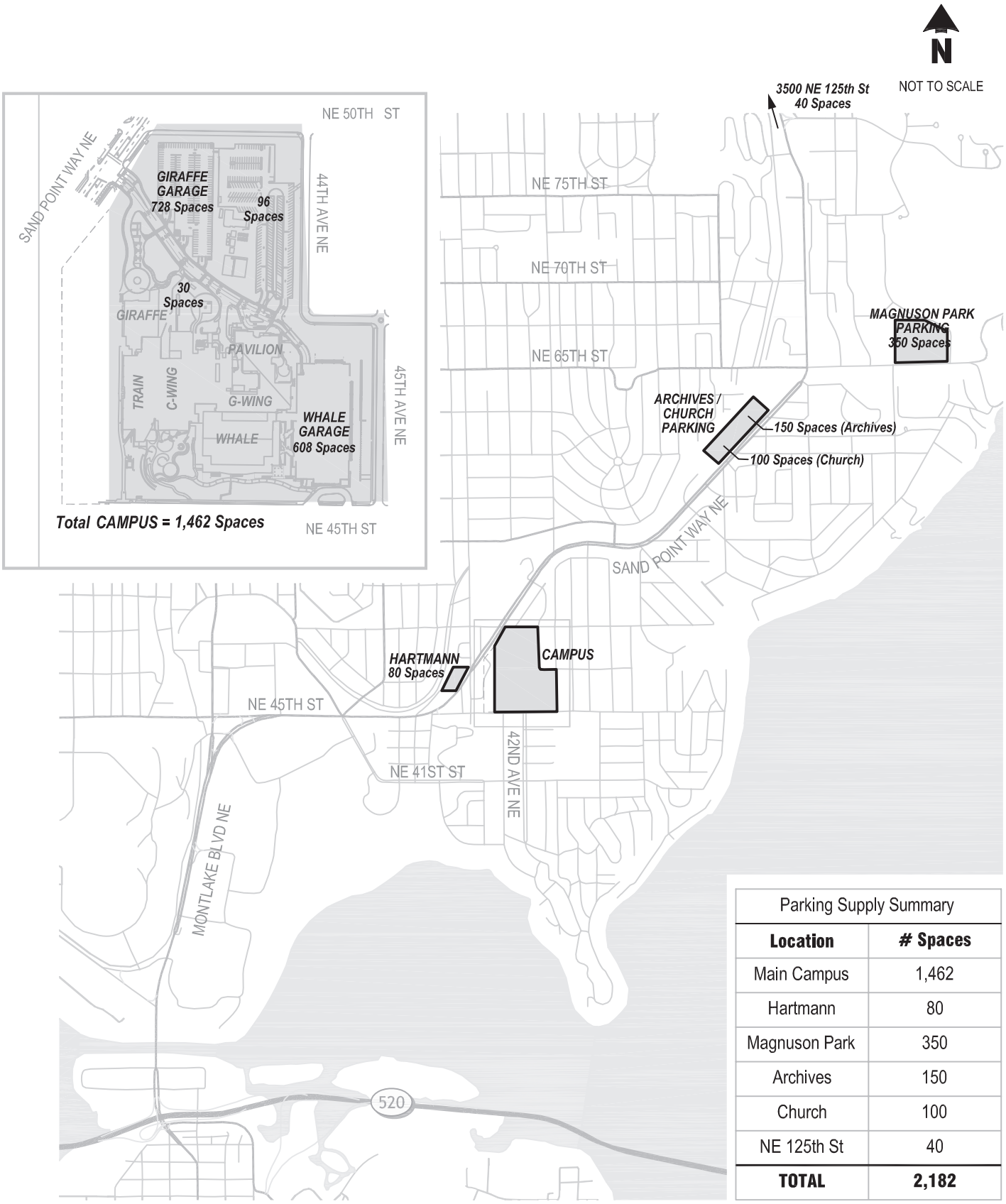
3.10.5 Parking

3.10.5.1 Affected Environment

Supply

Figure 3.10-7 (rev) shows the existing parking facilities associated with Children's. There are three parking areas located at the hospital and four off-site parking areas typically utilized by Children's employees.

33759484_104.cdr



Parking Supply Summary	
Location	**# Spaces**
Main Campus	1,462
Hartmann	80
Magnuson Park	350
Archives	150
Church	100
NE 125th St	40
TOTAL	**2,182**

Source: The Transpo Group

Figure 3.10-7rev
Existing Parking Facilities

Children's currently provides 1,462 parking spaces on campus and leases additional parking for employees northeast of the hospital on Sand Point Way NE, including 350 at Warren G. Magnuson Park, 100 at the Center for Spiritual Living, and 150 at the adjacent Federal Archives site. Children's also leases 40 parking spaces at the 13th Church at 3500 NE 125th Street. In addition, the Hartmann site includes 80 parking spaces on site. These parking areas total 2,182 spaces. Parking lots are free-of-charge to patients and visitors. Children's employees are charged for parking.

Children's Campus

The Giraffe Garage is located on the northwest corner of the campus across Penny Drive from the hospital. It provides 728 parking stalls for patients, visitors, staff, and physicians. The garage has four levels, which are not currently connected to each other; direct access to each level is via separate garage entrances off Penny Drive. The Whale Garage is located to the east of the Melinda French Gates Ambulatory Care Building. The three-level Whale Garage has 608 parking stalls for patients, visitors, staff, and physicians. It serves the main entrance of the Ambulatory Care Building and provides the Americans with Disabilities Act (ADA) accessible parking. Access to the Whale Garage is from Penny Drive. Ninety-six surface parking spaces are provided on the campus at the northeast corner[3]. An additional 30 parking spaces are scattered around the campus at the loading docks as well as entries to provide ADA accessible parking and unloading/loading spaces.

Demand

Parking demand is based on the combined effects of employees, visitors, patients, and other staff parking on Children's campus, at Hartmann, and at off-site lots.

Parking occupancy data was collected on Wednesday, February 7 and Thursday, February 8, 2007, the days that typically represent the highest on-campus parking demand. In addition, off-site parking data was collected on Monday, April 16, 2007. Total peak parking demand, based on the February and April 2007 data occurring at approximately 11:00 am, is approximately 1,750 spaces. Compared to the total supply (both on and off-site) of 2,182 spaces, this represents a parking utilization level of about 80 percent.

The off-site parking areas at Magnuson Park, Archives, Church, and others typically operate at lower utilization levels than the campus. Daily fluctuation of patients and visitors to Children's can challenge parking management staff to keep supply and demand in balance. Thus, on the same days that overall parking demand was about 1,750 spaces, peak parking demand on campus averaged approximately 1,330 spaces which reflects occupancy of about 90 percent of the spaces supplied.

The practical capacity of a parking lot is about 85 to 90 percent occupancy, which ensures vehicles circulating parking areas can locate a space, and accounts for peak surges and vehicles leaving parking spaces[4]. Thus, Children's parking has reached its practical capacity during peak parking demand with employee and patient/visitor occupancies above 90 percent.

[3] It should be noted that the number of parking spaces for the emergency department has been reduced due to interim modular office units and landscape maintenance operations which remove approximately 24 surface parking spaces.
[4] Industry standard based on *Parking* (Weant and Levinson 1990).

Parking Demand Management

Children's actively manages its campus and off-site parking. To encourage alternative transportation modes, Children's charges employees for parking as well as assigns parking based on shift, seniority, position, and compliance with Children's parking policies. On campus, parking is partitioned by user type to promote clarity and control for parking enforcement. Employee off-site parking lots are monitored by tracking license plate numbers, card keys, or parking permits. Children's employees are prohibited from parking on neighborhood streets, and both traffic flows and neighborhood parking violations are monitored by a full-time parking officer and supported by security staff.

Children's acknowledges the high patient/visitor parking demand and the difficulty to find available parking during peak hours. In order to manage parking, Children's offers free valet parking to patients and visitors on weekdays from 9:30 am to 3:30 pm. Valet parking allows Children's to manage their campus parking to provide more efficient use of existing parking supply and reduce the number of on-site parking spaces required.

3.10.5.2 Impacts

Alternative 1

Supply
With the No Build Alternative, the total parking supply would be the same as existing, 2,182 spaces.

Demand
Children's traffic would remain the same as existing; therefore, parking demand is expected to be the same. The current parking occupancy at the hospital is approximately 1,330 spaces which reflects 90 percent occupancy; and would be expected to be the same under the No Build condition.

Children's off-site parking area would continue to have utilizations of approximately 95 percent during peak parking demand. It is anticipated that both the hospital and off-site parking areas would be "full" during peak periods, making it difficult for employees and patients/visitors to find parking.

Parking Demand Management
The existing parking demand management strategies would remain in place with the No Build Alternative. Children's would continue to actively manage its hospital and off-site parking as well as charging employees for parking and assigning parking to encourage use of alternative modes. Children's is currently implementing a policy to increase employee parking costs. These increased charges may encourage some employees to shift from SOV to alternative modes, and thus, reduce the parking demand at the hospital and/or at off-site parking areas.

Alternatives 3, 6, 7R and 8~~7~~

Supply

The City of Seattle provides minimum and maximum parking requirements for major institutions such as Children's. The minimum parking supply requirement is based on a combination of numbers of employees, beds, outpatients, and auditorium seating. The maximum parking supply allowed by code is 135 percent of the calculated required minimum. Parking above the maximum can be allowed if the TMP goals are being met or exceeded. Table 3.10-8 shows the Build Alternatives minimum and maximum parking supply requirements based on the City's code.

Table 3.10-8
Build Alternatives Parking Supply Required by City Code

Code Requirement	Number Basis	Minimum spaces[1]	Maximum Spaces[1]
Long-Term Parking			
1 space per 80% of hospital-based MDs[2]	1,095 Children's Physicians	876	1,183
1 space per 25% of staff MDs[3]	409 Community Physicians	102	138
1 space per 30% of peak hour employees[4]	2,935 Children's Staff	881	1,189
Total Long-term Parking Spaces		*1,859*	*2,510*
Short-Term Parking			
1 space per 6 beds[5]	600 beds	100	135
1 space per 5 outpatients[6]	1,566 outpatient	313	423
1 space per 10 seats in auditorium	250 seats	25	34
Total Short-term Parking Spaces		*438*	*592*
Total Required Spaces		**2,297**	**3,102**

Source: Children's, May 2007; The Transpo Group, November 2007
Notes: MDs = medical doctors
1. Per Major Institutions Code, minimum parking based on code requirement shown. Maximum parking allowed by code is 135 percent of the calculated required minimum. Parking above maximum can be allowed if TMP goals are being met or exceeded.
2. Assumes 254 existing Children's University Medical Group physicians, and 103 existing Fellows which are increased by a factor of 2.11 to account for future growth due to the proposed master plan. Assumes 228 existing Residents increased by a factor of 1.5 to account for future growth due to the proposed master plan.
3. Based on 194 existing Community physicians from payroll database which are increased by a factor of 2.11 to account for future growth due to the proposed master plan.
4. Based on 1,391 existing employees on site during the afternoon peak hour including:
   783 Day Shift + 50% of Day/Evening and Day/Night — 11 Pace Temps
   200 On-Call and Exempt — 27 Students
   257 Evening Shift that overlaps with Day Shift — 80 Volunteers
   33 Employee Equivalent Off-Site employees
   which are increased by a factor of 2.11 to account for future growth due to the proposed master plan.
5. 600 beds for the proposed master plan based on project description.
6. 1,044 outpatients based on total outpatient population for the "highest day" in February 2007 which represents a conservative estimate. This outpatient population is increased by a factor of 1.5 to account for future growth due to the proposed master plan.

The City requires the project to supply approximately 2,300 to 3,100 parking spaces, either on site or within off-site parking lots. For the Build Alternatives, Children's is proposing to provide up to 3,600 spaces, which exceeds the City's parking supply requirements. The additional supply can be provided if the institution is meeting its TMP goal. Children's current TMP goal is 50 percent SOV, and the ~~most recent~~2006 Commute Trip Reduction (CTR) survey indicates Children's currently exceeds the goal at 38 percent SOV.

The analysis of traffic impacts included in this ~~D~~Final EIS was based on Children's providing 3,600 parking spaces with the majority of the spaces (approximately ~~2,600~~1,800 to 2,800) located at the hospital, and the remaining located at Hartmann (for Alternatives 3, 6 and 7R only), Laurelon Terrace (for Alternatives 7R and 8 only) and other off-site parking areas (Figure 3.10-8 (rev)). All parking areas, traffic flow, and neighborhood parking would continue to be supervised by a full-time parking officer and supported by the Children's security staff. With the implementation of additional mitigation measures to reduce parking demand, it is possible that the 3,600 may be reduced to 3,100. See "Parking Demand Management" below.

While not directly included in the calculation of mitigated conditions, Children's is continuing to explore opportunities to locate parking remotely and off-site, preferably outside the area of impact described herein. For every 100 spaces reduced on-site (and located out of the area) an approximately five to ten percent reduction in locally generated traffic could occur. Such parking would require further expansion of the proposed shuttle system.

On-Site Parking. All Build Alternatives would use the existing 608 parking spaces located in the Whale Garage. In addition, a parking garage (North Garage) would be built on the northeast corner of the property over the current surface parking lot, and the Giraffe Garage would be expanded. The North Garage parking levels would align with floors of the existing Giraffe Garage and would be connected to the Giraffe Garage by an internal ramp to improve the circulation system. The total parking spaces at the hospital (including Laurelon Terrace) and Hartmann would be up to 3,100 spaces for all Build Alternatives with the allocation shown in Table 3.10-9.

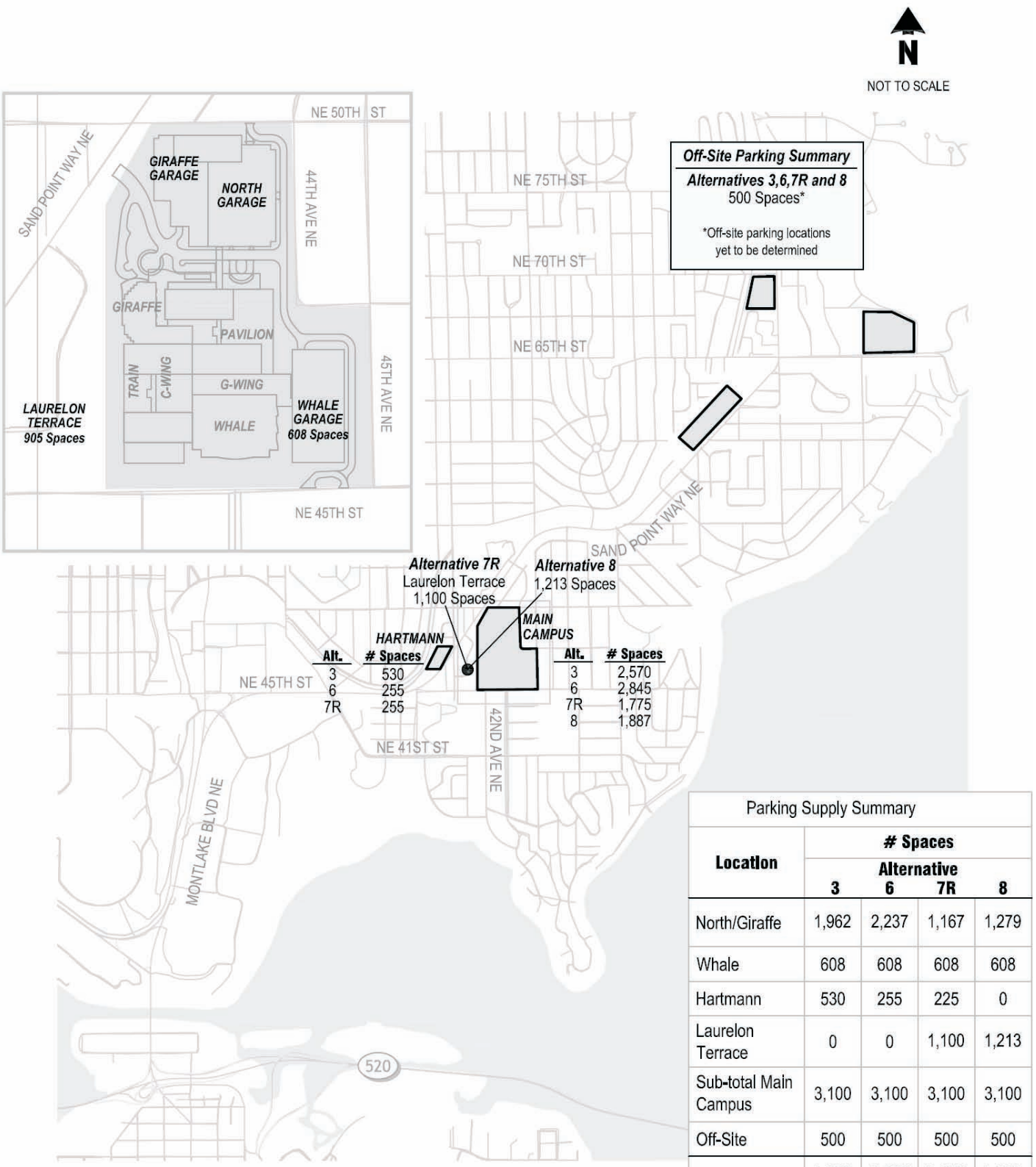
Hartmann and Off-Site Parking. ~~The Build~~ Alternatives 3, 6 and 7R would include construction of an underground parking garage at the Hartmann site with ~~255~~ 225 to 530 parking spaces depending on the alternative. It should be noted that Hartmann would not be included in the expansion proposal for Alternative 8 so no additional parking would be constructed at this location; the existing 80 parking spaces would remain.

Under all alternatives, off-campus parking would continue to be used to minimize localized traffic impacts, and free shuttles would continue to serve the remote parking lots to provide connections with Children's facilities. The capacity of the remote lots would be 500 spaces for all Build Alternatives. As a worst-case scenario, remote parking is assumed to be within the study area (i.e., north of the hospital). Parking located outside the area of impact would reduce Children's impacts on this transportation system.

Demand

Similar to trip generation estimates, peak hour parking demand was estimated based on employee and patient populations. The calculated total peak parking demand is approximately

33759484_162.cdr



Parking Supply Summary

Location	# Spaces			
	Alternative			
	3	6	7R	8
North/Giraffe	1,962	2,237	1,167	1,279
Whale	608	608	608	608
Hartmann	530	255	225	0
Laurelon Terrace	0	0	1,100	1,213
Sub-total Main Campus	3,100	3,100	3,100	3,100
Off-Site	500	500	500	500
TOTAL	**3,600**	**3,600**	**3,600**	**3,600**

Source: The Transpo Group

Figure 3.10-8 rev
Proposed Parking Supply

3,400 vehicles. The effective parking demand, or practical capacity, is determined by applying a design safety (circulation) factor to the hour with the highest parking demand. This ~~safety~~ factor allows for some reserve spaces to ensure that drivers circulating the parking area can find a space. It also accounts for peak surges and vehicles leaving parking spaces. It is typical to allow for a factor lower than 10 to 15 percent in cases where parking spaces are assigned, parking management strategies are applied (such as valet) in areas with lower parking turnover. Children's assigns parking to employees and provides valet for patients and visitors. This practice would continue in the future. Therefore, ~~E~~effective parking demand was calculated assuming a safety factor of five percent applied to the parking demand (i.e., 3,400 vehicles), yielding an effective parking demand of approximately 3,580 spaces; slightly less than the proposed parking supply, and thus the supply is adequate.

Table 3.10-9
Build Alternatives Proposed Unmitigated Parking Supply

Location	Alternative 3	Alternative 6	Alternative 7R	Alternative 8
North/Giraffe Garage	1,962	2,237	~~1,332~~1,167	1,279
Whale Garage	608	608	608	608
Laurelon Terrace	0	0	~~905~~1,100	1,213
Hartmann	530	255	225~~55~~	N/A
Total Campus	*3,100*	*3,100*	*3,100*	*3,100*
Off-Site Parking	500	500	500	500
Total Parking Supply	**3,600**	**3,600**	**3,600**	**3,600**

Source: Children's, March 2008.
N/A = Not applicable, Hartmann is not included as part of Alternative 8. It assumed that the existing 80 parking spaces would remain.

Parking Demand Management

It is anticipated that Children's would enhance parking demand management strategies with the increase in demand expected by the expansion. In addition, Children's would continue to actively manage its hospital and off-site parking as well as charge employees for parking and assign parking to encourage use of alternative modes. Children's is currently implementing a policy to increase employee parking costs. These increased charges (and the enhanced TMP and shuttle system) may encourage some employees to shift from SOV to alternative modes, and thus, reduce the parking demand at the hospital and/or at off-site parking areas. The results of the parking demand management strategy are summarized in Table 3.10-10 and described in Appendix D, Attachment T-9. With the proposed TDM and transit shuttles, the parking supply ~~w~~could be reduced from 3,600 spaces to 3,100 spaces.

The reduced parking demand ~~would~~ could be met by eliminating the leasing of off-campus parking spaces. Table 3.10-11 illustrates ~~T~~the proposed location of the 3,100 spaces, assuming implementation of the proposed TDM and transit shuttles, ~~would be as shown in Table 3.10-11.~~and elimination of off-site parking. Children's has secured a letter of intent with Sound Transit and Community Transit to identify long-term partnerships. The intent includes potential private-public partnerships which would allow Children's to access current or future Sound Transit park-and-ride lots. If off-site parking can be secured to help meet parking demand, Children's may be able to reduce the number of new spaces it is proposing to build on campus. This reduction would reduce localized traffic impacts. For every 100 spaces secured off-site (and out of the area), mitigated traffic impacts would be reduced by approximately five to ten percent.

Table 3.10-10
Future Peak Parking Demand at MIMP Buildout

~~Peak Parking Demand in 2028~~Population Group	Without Mitigation	With TDM Programs	With TDM and Transit Shuttles
Children's Employees – Day Shift	830	690	510
Children's Employees – Non-day Shift	635	610	550
Community Physicians	270	250	240
Students, Residents and Fellows	290	200	190
Other employees	555	550	560
Patients (in- and out-)	890	890	890
Total	*3,470*	*3,190*	*2,940*
Effective Demand (+5% for circulation	3,600	3,350	3,100

Source: Nelson\Nygaard Consulting Associates, Inc., 2008.

Table 3.10-11
Build Alternatives Proposed Mitigated Parking Supply

Location	Alternative 3	Alternative 6	Alternative ~~7~~7R	Alternative 8
North/Giraffe Garage	1,962	2,237	~~1,332~~1,167	1,279
Whale Garage	608	608	608	608
Laurelon Terrace	0	0	~~905~~1,100	1,213
Hartmann	530	255	~~255~~225	0
Total Campus	*3,100*	*3,100*	*3,100*	*3,100*
Off-Site Parking[1]	0	0	0	0
Total Parking Supply	**3,100**	**3,100**	**3,100**	**3,100**

Source: Children's, March 2008.

1. Instead of eliminating off-site parking, as part of Children's mitigation strategy, Children's intends to identify and develop up to 500 off-site parking spaces to reduce Children's traffic to and from the campus and to reduce campus parking supply. Per SDOT recommendation, the off-site parking would be located outside the study area.

3.10.6 Non-Motorized Travel – Pedestrian and Bicyclists

3.10.6.1 Affected Environment

Based on the 2006 CTR survey, approximately five percent of Children's employees walk to work, while six percent bike to work (CHRMC 2006). Overall pedestrian and bicycle volumes near Children's are generally low to moderate, typical of suburban areas. The location of the Burke Gilman Trail west of Sand Point Way NE attracts pedestrians and bicyclists from the east, both from Children's and the Laurelhurst neighborhood. On campus, pedestrian activity is high as patients and employees cross Penny Drive going to and from parking areas and the transit stop.

Figure 3.10-9 identifies non-motorized facilities serving Children's and the Hartmann site. The majority of local streets adjacent to Children's including portions of Sand Point Way NE have sidewalks on both sides which are generally five feet wide. There are intermittent sidewalks on the east side of Sand Point Way NE between NE 50th Street and 40th Avenue NE and on-street parking is permitted on the east side of Sand Point Way NE near Children's. There are no sidewalks on the north side of NE 50th Street between 41st Avenue NE and 40th Avenue NE.

3.10.6.2 Impacts

Alternative 1

Pedestrian and bicycle facilities on the campus and the Hartmann site are assumed to remain the same as existing. The City's Capital Improvement Program for 2008 includes ADA access and sidewalk improvements along Sand Point Way NE between 40th Avenue NE and 41st Avenue NE. In addition, the Sand Point Way NE/40th Avenue NE intersection would be signalized which would provide an easier and safer pedestrian crossing along Sand Point Way NE.

The UATAS evaluated pedestrian and bicycle conditions within the study area along key corridors, Montlake Boulevard and NE 45th Street. This evaluation resulted in a number of identified improvements to address known deficiencies along key pedestrian and bicycle routes.

Alternatives 3, 6, 7R and 8~~7~~

Pedestrian and bicycle volumes near Children's would likely continue to be low to moderate, typical of suburban areas. On-site pedestrian levels would likely increase in the future since the proposed larger hospital would serve more patients and have more employees. Although not relied on in the evaluation of traffic and parking impacts, as Children's continues to improve their TMP, it is likely that in the future the number of Children's employees walking and biking to work would increase.

For all Build Alternatives, Children's would construct new sidewalks on portions of the west side of Sand Point Way NE between NE 50th Street and 40th Avenue NE, along the east side of Sand Point Way NE between NE 50th Street and 47th Avenue NE and along the Hartmann site frontage (except Alternative 8 which does not include Hartmann). The proposed pedestrian and bicycle facilities are shown on Figure 3.10-10 for Alternatives 3 and 6, and Figure 3.10-11 (rev) for Alternatives 7R and 8. Each of the Build Alternatives includes pedestrian connections to

both transit and Children's shuttle stops as part of an integrated site design. As part of their mitigation strategy, Children's intends to help fund improvements to local pedestrian and bicycle facilities including projects in the City of Seattle Bicycle Master Plan, connections from Children's to the larger non-motorized network, and potentially bicycle boulevards. These are~~is~~ ~~is~~ intended to enhance the attractiveness of travel by non-SOV travel modes.

Alternatives 3 and 6 are similar in general layout and overall pedestrian environment would be similar. Most pedestrian or bicycle activity would occur on campus or along Sand Point Way NE at Penny Drive for pedestrians and bicyclists accessing transit service or the Burke-Gilman Trail. Alternatives 7R and 8 includes development on the current Laurelon Terrace property with a more urban frontage on Sand Point Way NE and 40th Avenue NE. Enhancements to the sidewalk along this frontage and potential location of transit stops adjacent to 40th Avenue NE on Sand Point Way NE would result in a more activated pedestrian environment and urban streetscape.

Penny Drive would continue to be the primary access to Children's for vehicles, pedestrians, and bicyclists. Pedestrian crossings on Penny Drive would be consolidated to three ADA-accessible crossings between the parking garages and plaza entrances for inpatient, outpatient, and emergency services. A new covered walkway would connect the proposed North Garage with the hospital facilities.

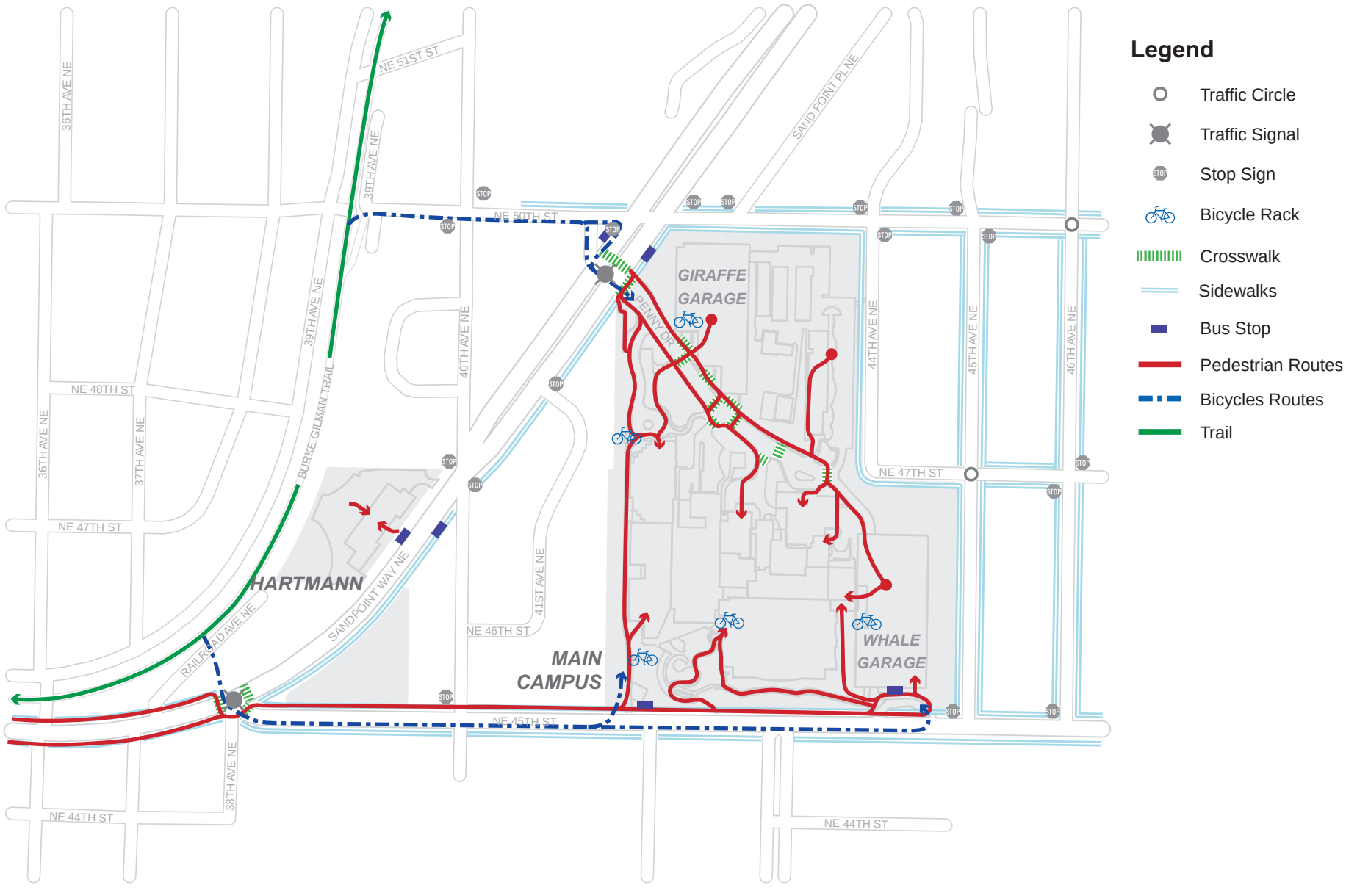
With the Build Alternatives, all the bicycle parking would remain, and additional secured bicycle parking would be provided in the proposed North Garage.

~~The Build~~ Alternatives 3, 6 and 7R also would include new pedestrian and bicycle facilities at the Hartmann site. An ADA-accessible pedestrian entrance would be located on the east end of the site along Sand Point Way NE.

With the addition of traffic signals along Sand Point Way NE at NE 50th Street, ~~the Build~~ Alternatives 3 and 6 would make it easier and safer to cross Sand Point Way NE at more locations, improving accessibility and safety. This also would enhance the connection of Children's to the Burke-Gilman Trail and surrounding neighborhoods.

Laurelhurst Elementary School and The Villa Academy are located east of the site. The majority of Children's traffic would be oriented to and from the west and continued parking policies and enforcement would continue to discourage Children's traffic from parking in the local neighborhoods. Development of the alternatives is not expected to degrade pedestrian safety.

33759484_19.cdr



Source: The Transpo Group

Figure 3.10-9
Existing Non-Motorized Facilities

Source: The Transpo Group

Figure 3.10-10

Proposed Non-Motorized Facilities - Alternatives 3 and 6

33759484_163.cdr

Source: The Transpo Group

Figure 3.10-11 rev

Proposed Non-Motorized Facilities - Alternatives 7R and 8

3.10.7 Transit and Shuttle Services

3.10.7.1 Affected Environment

Transit and private shuttle service have important roles in serving Children's current travel demand, supporting the overall TMP goals of reducing SOV travel and campus parking management efforts.

Transit

Children's and the Hartmann site are served by King County Metro Transit Routes 25 and 75 (Figure 3.10-12), which operate on 15 to 30-minute headways on weekdays; Route 75 provides 30-minute headways on weekends. Based on the 2006 CTR survey, approximately 10 percent of Children's employees commute via transit. Eighty percent of employees who commute via transit use King County Metro and the remaining 20 percent use other transit services including Community Transit, Sound Transit, and Pierce County Transit (CHRMC 2006).

Riders accessing Children's via Route 75 are dropped off on Sand Point Way NE, and must walk on an uphill path for about a quarter-mile, crossing a number of garage entrances, to reach Children's main entrance. This difficult walk for riders makes transit a slightly less desirable mode choice.

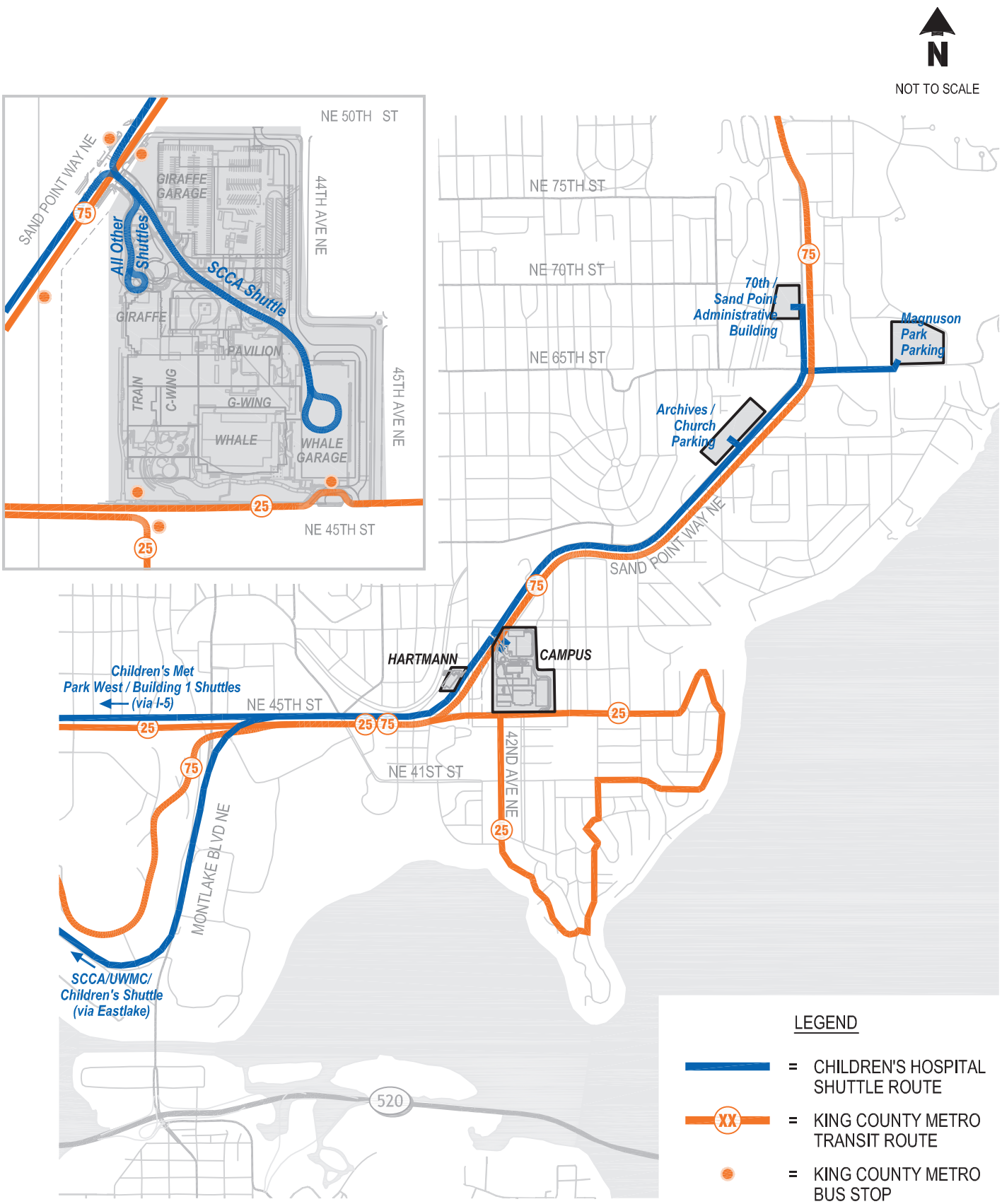
In May 2007, in anticipation of its proposed Master Plan expansion, Children's partnered with Metro Transit to fund additional bus service on routes 25 and 75 during the hours when Children's employees are changing shifts. This partnership increased service levels of these routes for both Children's and neighborhood users by adding a total of 63 roundtrips on Routes 25 and 75 starting in September 2007. The increased service provides higher frequencies during shift changes.

Shuttle Services

Children's operates six shuttle routes that provide access to three off-site employee parking lots as well as connections to and from the hospital, administrative buildings, and research facilities. The connection to off-site parking serves employee commuter travel and reduces the need for campus parking. Patients and visitors do not use the off-site parking lots or shuttles.

Shuttle service to the off-site parking lots at Magnuson Park, the Archives, and the Church operates Monday through Friday from approximately 6:00 am to 7:00 pm. There is no shuttle service to off-site parking lots on weekends or holidays; employees who normally park in the off-site parking lots on weekdays park at the hospital at these times. At the hospital, the shuttle stop is located adjacent to the Giraffe entrance. The shuttles run every 7 to 15 minutes during peak times and less frequently during other times of day. Based on shuttle ridership counts, conducted in October 2007, the shuttles to off-site parking areas have about 1,000 total riders per day, reflecting approximately 12 percent of the peak hour commuter mode split.

33759484_20.cdr



Source: The Transpo Group

Figure 3.10-12
Existing Shuttle and Transit Service

Weekday shuttle services between the hospital and off-site facilities serve the administrative building located at NE 70th Street/Sand Point Way NE, the research facilities at Metropolitan Park West (1100 Olive Way), and the Children's Research Institute (1900 9th Avenue). The shuttles are operated from approximately 6:00 am to 7:00 pm. They provide inter-facility transportation while reducing traffic and parking congestion at Children's from staff, physician, and patient trips.

In addition to the shuttle services operated by Children's, Fred Hutchinson Cancer Research Center also provides shuttle service from the Seattle Cancer Care Alliance to the University of Washington Medical Center (Muilenberg Tower) and Children's (Whale Entrance). This shuttle runs every 40 minutes between 7:00 am and 7:00 pm.

3.10.7.2 Impacts

Alternative 1

The analysis of traffic and parking impacts assumed no change (increase) in the level of use of shuttle and transit as part of the No Build Alternative. It is likely that over time as these modes become more accessible and congestion increases, shuttle and transit use would increase.

Alternatives 3, 6, 7R and 8~~7~~

Children's would continue to work with King County Metro, Sound Transit, and Community Transit to expand their services at or near Children's and to optimize the hours of operation and frequency of service (see Appendix D, Attachments T-10, ~~and~~ T-11 and T-12 for agreements with agencies). ~~The Build Alternatives do not include improvements to shuttle and transit services; however, w~~With Alternatives 7R and 8, transit stops would be relocated to the Sand Point Way NE/40th Avenue NE intersection. This relocation allows transit to serve both the Hartmann site and the hospital with one stop. In addition, with the transit stops near 40th Avenue NE, riders would access Children's without having to travel uphill along Penny Drive.

Children's shuttle system would continue to serve the remote parking lots and connect to other Children's facilities, and may be expanded to serve other destinations. As part of Children's mitigation strategy ~~S~~shuttle service expansion is currently ~~being studied and different strategies are~~ being explored (see Appendix D, Attachment T-9). As a result of the shuttle studies being conducted, Children's recently implemented the "Green Line" shuttle which provides direct service between Children's and downtown Seattle.

Penny Drive ~~would~~ is assumed to remain the primary access for all shuttle vehicles. At the hospital, for all Build Alternatives, a shuttle arrival and departure area would be provided at the Giraffe entrance separate from the loading dock area. As the site design evolves, a combined shuttle and transit hub at the Sand Point Way NE/40th Avenue NE intersection is being considered for Alternatives 7R and 8.

3.10.8 Helistop

3.10.8.1 Affected Environment

Typically, Children's has experienced three to four daytime (7:00 am to 10:00 pm) landings and one to two nighttime (10:00 pm to 7:00 am) landings per month, on average. Emergency flights on a given day have been as frequent as two during the daytime period and two during the nighttime period. Each landing consists of two operations – one arrival and one departure. Children's security staff secures the emergency department and helistop for helicopter landings. A Children's security staff member is posted during helicopter landings, during the time the helicopter remains on the helistop, and during departure.

3.10.8.2 Impacts

All Alternatives

On average, Children's experiences three to four daytime landings and one to two nighttime landings per month. For the last five years, the average has been 60 landings per year. Using a standard population/use rate methodology to project future helicopter air ambulance patient landings at Children's, the projected landings per year are 62 by 2010, 71 by 2020, and 77 by 2030.

3.10.9 Phasing and Construction Impacts

The Children's expansion would be completed over a 20-year period in four phases for all Build Alternatives.

3.10.9.1 Phasing

The following presents an evaluation of phasing for each aspect of the transportation system (i.e., street system, traffic volumes, traffic operations, traffic safety, parking, non-motorized, and shuttle and transit) under the Build Alternatives.

Street System

For the purpose of the phasing analysis, it is assumed that the regional transportation infrastructure (SR 520, UATAS improvements, etc.) would be similar to current conditions. This provides a worst-case analysis context for considering phased impacts. To the extent that infrastructure improvements are constructed and operational prior to occupancy of any Children's development phase, overall traffic operations may be better than described herein.

The mitigation for the overall master plan identified a number of near-site transportation improvements. The following near-site street improvements would be constructed by Phase 1:

- Alternatives 3 and 6 – Sand Point Way NE/Penny Drive intersection improvements including shifting Penny Drive to the north, additional capacity, and upgrading the traffic signal
- Alternatives 3 and 6 – Sand Point Way NE frontage improvements

- Alternatives 7R and 8 – 40th Avenue NE frontage and site access improvements

Traffic Volumes

Trip generation by phase was calculated using the method discussed in Section 3.10.2.2 of this Final EIS, and by the anticipated beds per phase. The pace of bed development is anticipated to be faster than the pace of clinic space development; therefore, this approach likely over estimates the level of trip generation for Phases 1, 2, and 3 of the Build Alternatives and presents a conservative estimate of potential traffic impacts for these phases. Table 3.10-12 shows ~~the portion of the expansion~~ expected net new trips generated for ~~*to be completed at*~~ *each* phase of the Build Alternatives. ~~and the level of net new trips generation by the phase.~~ These trips represent unmitigated conditions. Implementation of the Comprehensive Transportation Plan (i.e., Children's mitigation strategy) is expected to decrease the trip generation for each phase.

As shown in Table 3.10-12, ~~each phase would generate between 100 and 300 net new peak hour trips. It is expected that impacts at each phase would be similar to the impacts of the full build-out discussed in previous sections.~~ the overall net new trips per phase is less than Children's net new vehicle trips for completion of the Build Alternatives (i.e. Phase 4); therefore, volume impacts at each phase are anticipated to be less.

Children's traffic was added to 2012 without project conditions to form the basis of the Phase 1 analysis. The forecast for 2012 without project conditions were developed using the City's travel demand model and the same methods described for 2030 forecasts. Appendix D, Attachment T-2 shows the Phase 1 project trip assignment, No Build 2012, and Phase 1 traffic volumes. Traffic volume impacts due to Children's traffic were evaluated for Phase 1, Alternatives 3 and 6, during the PM peak hour unmitigated conditions. These represent the worst-case disclosure of impacts for this phase. Impacts associated with Alternatives 7R and 8 would be approximately one-third less than described for Alternatives 3 and 6. The PM peak hour would continue to represent the heaviest traffic flows in the study area in the future. Subsequent Children's phases would be evaluated as Children's applies for permits over the 20-year development of the master plan. At intersections closer to the hospital and along the access corridors, Children's trips represent a larger percentage of overall traffic than at intersections farther from the site.

Increases to traffic volumes within the study area would be small i.e., two to four percent. These increases are within the normal range of daily fluctuations in traffic volumes which can vary between 5 to 10 percent. No additional mitigation measures would be recommended based on traffic volumes alone.

Table 3.10-12
Build Alternatives Forecasted ~~Proposed~~ Net New Trips ~~Phase~~ – Unmitigated[1]

	Alternative 3				Alternative 6				Alternative 7R				Alternative 8			
Phase	**Beds**	**Daily**	**AM Peak Hour**	**PM Peak Hour**	**Beds**	**Daily**	**AM Peak Hour**	**PM Peak Hour**	**Beds**	**Daily**	**AM Peak Hour**	**PM Peak Hour**	**Beds**	**Daily**	**AM Peak Hour**	**PM Peak Hour**
1	377	3,000	305	250	377	3,000	305	250	336	2,000	205	165	336	2,000	205	165
2	557	7,200	745	600	521	6,400	655	525	408	3,800	385	305	408	3,800	385	305
3[2]	532	6,600	680	550	605	8,400	850	690	604	8,400	850	690	604	8,400	850	690
4 /Build-out[3]	604	8,400	850	690	605	8,400	850	690	604	8,400	850	690	604	8,400	850	690

Source: Children's and The Transpo Group, September 2008

1. Net new trips shown are cumulative e.g., Phase 2 volumes include trips that would be made in both Phases 1 and 2.
2. Decrease in Children's trips for Alternative 3 due to the demolition of Train beds.
3. Trips were determined based on the pace of bed development. For Phase 4, Alternatives 7R and 8, no change in traffic levels is shown between Phases 3 and 4 since traffic from the development of clinics is included in a previous phase. Therefore, this method potentially overestimates traffic levels for Phases 1, 2, and 3.

Traffic Operations

Phase 1 impacts were evaluated assuming traffic generated by Alternatives 3 and 6, which reflect the highest number of beds proposed in Phase 1. Subsequent Children's phases would be evaluated as Children's applies for permits over the 20-year development of the Master Plan. Similar to the disclosure of full build-out, both individual intersections and key corridors were evaluated.

Intersections

Appendix D shows the anticipated levels of service for off-site study intersections. Based on the criteria used to evaluate full build-out, the following two intersections would be most affected by the addition of Children's Phase 1 traffic:

- **NE 45th Street/Union Bay Place NE (Five Corners) –** This intersection would operate at LOS F during the PM peak hour under No Build 2012 conditions. With the addition of Children's traffic by 2012, this intersection would continue to operate at LOS F during the PM peak hour and the overall intersection delay would increase by about 16 seconds.
- **40th Avenue NE/NE 55th Street –** This intersection would operate at LOS D during the PM peak hour under No Build 2012 conditions. With the addition of traffic associated with Phase 1, this intersection would degrade to LOS E and calculated delays would increase by about 12 seconds.

In addition to the intersections listed above, the Montlake Boulevard NE/eastbound SR 520 Ramps would continue to operate at LOS E with the addition of Children's traffic in 2012. The increase in overall intersection delay would be less than five seconds. All other study intersections would operate at LOS D or better during the PM peak hour.

Key Corridors

The analysis of key corridors provides an understanding of system performance using corridor travel times as the criteria for evaluation. Appendix D provides a summary of projected 2012 travel times for No Build and Phase 1 conditions.

Sand Point Way NE Corridor. The travel time to and from Children's would be approximately the same for No Build 2012 and Phase 1 conditions. This is consistent with the results of the intersection levels of service which show little to no change in operations between the No Build and Phase 1 for intersection operations along this corridor.

Montlake Boulevard Corridor. The additional traffic due to Phase 1 would increase travel times along the Montlake corridor by approximately one minute in the southbound direction. This one minute increase is equivalent to an eight percent change in overall travel time. Travel speeds would decline in the southbound direction commensurate with added delay between the No Build and Phase 1 conditions. Travel in the northbound direction would be similar with and without Phase 1 traffic. This is consistent with the results of the intersection analysis for this corridor which show the majority of the service levels along this corridor would remain the same between the No Build and Phase 1 conditions.

NE 45th Street Corridor. The additional traffic due to Phase 1 would increase travel times along the NE 45th Street corridor by approximately one minute in the westbound direction. This is consistent with the results of the intersection levels of service which show intersection operations at "bottleneck" locations (i.e., I-5 and five corners) would worsen which contributes to the increase in travel time to and from Children's. Travel in the eastbound direction would be similar with and without Phase 1 traffic.

All of the travel time impacts are shown for the unmitigated condition. Successful implementation of the TMP is expected to result in a 30 to 40 percent reduction in PM peak hour traffic volumes. While it is not clear what level of demand reduction would occur with Phase 1, some level of reduction would be likely.

Site Access

For Alternatives 3 and 6, Children's proposes access via the existing Penny Drive signal and NE 50th Street. Based on the level of development and the forecasted trip generation, one driveway (i.e., Penny Drive only) is sufficient to serve Alternatives 3 and 6 Phase 1 development.

For Alternatives 7R and 8, Phase 1 access would be provided via 40th Avenue NE. Alternatives 7R and 8 would not include the NE 50th Street access.

Access Operations

For Alternatives 3 and 6 at Phase 1, a majority of the traffic would use Penny Drive since a large portion of the parking would be easily accessible from this location. Children's would complete the Sand Point Way NE/Penny Drive improvements as part of Phase 1. The access analysis for completion of Children's expansion shows good operations at this intersection with the planned improvement. Therefore, it is anticipated that with lower traffic volumes generated at 2012 with Phase 1, this intersection would have good operations. The Sand Point Way NE/Penny Drive intersection operations would meet the City's LOS D standard with development of subsequent phases.

During Phase 1, Alternatives 3 and 6 would not require the NE 50th Street access. Therefore, signalization of the Sand Point Way NE/NE 50th Street intersection would not be required as part of Phase 1. It is anticipated that with 2012 traffic, the Sand Point Way NE/NE 50th Street intersection would continue to operate at acceptable levels of service.

For Alternatives 7R and 8, Phase 1 traffic would access the expanded campus via 40th Avenue NE. Signalization of the Sand Point Way NE/40th Avenue NE intersection is anticipated by 2009. The access analysis for completion of Children's expansion shows good operations at this intersection with the planned improvement. Therefore, it is anticipated that with lower traffic volumes generated at 2012 with Phase 1, this intersection would have good operations. The Sand Point Way NE/40th Avenue NE intersection operations would meet the City's LOS D standard with development of subsequent phases.

Traffic Safety

General traffic increases may contribute to increased potential for conflicts; however, no new safety hazards would be created. Children's proposed mitigation includes construction of near-site pedestrian and bicycle facilities improving safety crossing Sand Point Way NE, and contribution of several million dollars to pedestrian and bicycle projects near the site.

Parking

Detailed parking supply and demand by phase are provided in Appendix D. The phased parking analysis illustrates that imbalances between parking supply and demand could potentially occur depending on the actual achieved transportation mode splits (and thus actual parking demand) and the actual number of spaces constructed (and made available). In cases of under supplying parking, improved TMP performance and/or utilizing off-site parking, as Children's does currently, would mitigate the potential shortfall. In the case of over parking supply, no adverse parking impact would be expected. However, over supplying parking would not be consistent with achieving TMP goals. Therefore, for those phases that would result in excess parking (e.g., Alternatives 7R and 8 – Phase 2), Children's could consider reducing the stalls made available to employees.

Non-Motorized Facilities – Pedestrian and Bicyclists

Increases in regional traffic would lead to increases in potential conflicts between vehicular and non-motorized modes within the regional and local study areas. Children's proposes a number of near-site improvements to enhance safety and convenience of pedestrian and bicycle connections to the Burke-Gilman Trail and surrounding neighborhood. In addition, Children's proposal includes funding several million dollars in other City designated non-motorized projects.

Shuttle and Transit Services

At all phases, Children's would continue to work with King County Metro, Sound Transit, and Community Transit to expand their services at or near Children's and to optimize the hours of operation and frequency of service. The analysis of the Build Alternatives at each phase does not rely on improvements to shuttle and transit services. For Phase 1, Penny Drive would remain the primary access for all shuttle vehicles.

Helistop

The new helistop would be relocated in Phase 1 for all Build Alternatives; detailed phasing is provided in Section 3.5 Noise of this Final EIS.

3.10.9.2 Construction

~~Construction parking would be provided either on-site or at off-site parking areas supported by shuttle service to and from the campus. Therefore, no parking impacts are expected during each phase of the project.~~

Construction traffic impacts would occur periodically throughout the 20-year development of the master plan. Construction traffic would be generated as each phase of the master plan ~~was~~ is constructed, and phasing may overlap. A majority of the truck traffic would be attributed to hauling excavation materials off-site. The amount of excavation varies from approximately 435,000 to 665,000 cubic yards for each Build Alternative, and the duration of the excavation is approximately three to ten months for each phase (depending on the total excavation for that phase). ~~Based on the preliminary construction phasing, an~~ Table 3.10-12a provides a summary of estimated truck traffic per day and per hour for each of the Build Alternatives by phase. The calculation of daily truck traffic assumes 20 working days per month and six-hours per day when deliveries to and from the site would be allowed. It is assumed that truck traffic would be prohibited from entering and exiting the site during the morning and evening commute hours.

Table 3.10-12a
Build Alternatives Construction Truck Traffic (Average Maximum Roundtrips)

Phase	Alternative 3			Alternative 6			Alternative 7R			Alternative 8		
	Duration (months)	Trucks per Day[1]	Trucks per Hour[2]	Duration (months)	Trucks per Day[1]	Trucks per Hour[2]	Duration (months)	Trucks per Day[1]	Trucks per Hour[2]	Duration (months)	Trucks per Day[1]	Trucks per Hour[2]
1	10	34	6	10	48	8	5	36	6	5	36	6
2	5 to 10[3]	84	14	5 to 10[3]	78	13	7	42	7	7	27	4
3	3	13	2	3	38	6	5	65	11	5	83	14
4	3	18	3	3 to 5[3]	82	14	5	68	11	5	68	11

Source: Children's and The Transpo Group, March 2008.
1. Trucks per day assumes trucks hold 20 cubic years and there are 20 working days per month.
2. Trucks per hour assumes there are six-hours per day where deliveries are allowed.
3. The total duration when excavation would occur would be ten months; however, truck traffic would vary since there would be three different areas where excavation would occur with some portions taking longer to excavate than others.

As shown in Table 3.10-12a, daily truck traffic would range from an average maximum of approximately 20 to 80 round-truck trips per day. Alternative 3 would generally have less truck traffic than the other Build Alternatives since less excavation is required. Alternatives 7R and 8 would have similar levels of truck traffic since the excavation needs are approximately the same.

Assuming truck deliveries occur over a six-hour period, this equates to an average maximum of approximately 3 to 14 round-truck trips per hour (or a total of 6 to 28 truck trips per hour). Examining a one hour time period shows that with an average maximum of 6 to 28 truck trips per hour there would be less than one truck per minute. This daily and hourly truck traffic is the average maximum for the excavation period which is anticipated to be an average of less than six months over the two to four years of construction per phase. It is anticipated that during other periods of construction, truck traffic would be less intense.

The remaining traffic generated by construction would be by construction workers. The maximum number of construction workers on-site is anticipated to be approximately 250 workers. Assuming average vehicle occupancy of approximately 1.1 passengers per vehicle, 250 workers would generate approximately 230 vehicle trips. Construction parking would be provided at off-site parking areas supported by shuttle service to and from the campus. Therefore, no parking impacts are expected during any phase of the project.

~~average of 40 to 80 weekly truck/delivery trips (i.e., roundtrips) are estimated by phase during the construction. With the overlapping of phases, the maximum average weekly truck/delivery trips is expected to be approximately 115 roundtrips (or a total of 230 trips per week). Assuming a five-day work week, this equates to approximately 23 roundtrips per day for construction trucks/deliveries or a total of 46 truck trips (i.e., 23 inbound and 23 outbound trips).~~ With the overlapping of construction and phasing, it is anticipated that portions of the expansion would be generating traffic while construction is underway. For example, after completion of Phase 1 and during peak periods of Phase 2 construction, Children's could generate up to 570 AM peak hour and 490 PM peak hour vehicle trips (i.e., Phase 1 traffic plus truck traffic and maximum construction worker traffic). This would be less than Children's forecasted 2030 Build Alternatives traffic generation without the enhanced TMP. Peak periods of construction are anticipated to be on average approximately six months, and during other times traffic generated by construction workers and trucks are anticipated to be less; therefore, impacts are anticipated to be less than or similar to full buildout. The combined affects of Children's expansion and construction traffic for subsequent phases may be higher than the 2030 Build Alternatives depending on the hours of operations and success of Children's TMP. Subsequent Children's phases would be evaluated as Children's applies for permits over the 20-year development of the master plan. ~~As a worst case scenario, if the expansion was completed through Phase 4 and construction was still occurring, Children's net new peak hour traffic could potentially increase from 850 trips at build-out to 896 trips with build-out and construction during the AM peak hour, and from 690 trips at build-out to 736 trips with build-out and construction during the PM peak hour. This represents a five to six percent increase in traffic volume. This is considered a potential construction impact.~~

~~The remaining traffic generated by construction of the expansion would be by construction workers. At this time, it is unknown how many construction workers would be on site; however, traffic generated by construction workers and construction trucks/deliveries combined is expected to be less than the net new traffic generated by full development of the Children's expansion (i.e., 8,400 net new daily trips). Therefore, construction impacts (without additional Children's traffic) on the surrounding transportation system are expected to be less than those with full build-out of the master plan.~~

Construction traffic impacts would depend on final design details, truck routes (expected primarily via Sand Point Way NE), and construction schedule. Impacts generally would include:

- Arrival, departure, and parking of construction worker vehicles or shuttles
- Delivery of construction materials
- Removal of debris associated with demolition activity
- Delivery of construction vehicles and machinery

- Delivery or removal of material associated with fill or excavation activity
- Potential conflicts with bicyclists and pedestrians crossing Sand Point Way NE

3.10.10 Mitigation Measures

This section summarizes measures identified to mitigate the impacts of the proposed Children's Master Plan. It includes:

- **Construction Traffic Mitigation**. Mitigation to address construction traffic impacts is described.
- **Operation Traffic Mitigation**. Mitigation to address operational traffic impacts is described. This section includes:
  - Children's Design and Facilities – including campus design, near-site improvements and off-site parking
  - Children's Enhanced Transportation Management Plan (TMP)
  - Proposed Intersection Improvements
  - Children's Contributions to Area Transportation Facilities – including corridor ITS and Northeast Seattle transportation, pedestrian and bicycle improvements
- ~~**Children's Proposal – Comprehensive Safety and Mobility Plan (CSMP)**. Children's is proposing a combination of investments in transit, shuttles and other non-SOV travel inducements, as well as capital improvement strategies.~~

3.10.10.1 Construction

Children's would develop a ***Cconstruction Mmanagement pPlan*** describing procedures for construction activity including such items as truck routes, hours of operation, and construction parking for approval by the City. The following measures would be included to mitigate potential traffic and parking impacts of construction activity during each phase of the master plan:

- Contractors would be required to direct that all construction worker vehicles be parked in a remote off-site parking lot ~~or in a temporary on-site parking area~~and served by Children's shuttles
- Construction activities would be scheduled so that the most intensive activities in terms of construction traffic are spread out over time and avoid period of peak traffic congestion
- Safe pedestrian and vehicular circulation would be provided adjacent to the construction site through the use of temporary walkways, signs, and manual traffic control (flaggers)
- Construction material delivery vehicles would be prohibited from leaving or entering the area during AM and PM peak hours
- Truck routes would be identified

- ~~The potential parking impact of construction workers could be mitigated by securing additional off-site parking for construction workers and shuttling them to and from the site~~

Additional measures that would be considered as part of the ***Construction Management Plan*** include conducting a pre-construction inventory of the local street system. During construction Children's will work with the City to address any traffic impacts that may be caused by construction activities. After completion of construction, assess the street network to determine potential roadway damage caused by Children's construction and work with the City to make any needed repairs or provide additional mitigation.

3.10.10.2 Operation ~~Children's Proposal – Comprehensive Safety and Mobility Plan~~

~~—~~Children's proposed mitigation strategy ~~is a response to the issues raised by this study and the community, and is offered as a *Recommended Comprehensive Safety and Mobility Plan of the 2008 MIMP*~~has evolved since the Draft EIS was published. The evolution has been in response to feedback from the community and City on the mitigation proposed in the Draft EIS. It is described in detail in Appendix D, Attachment T-9 to this Final EIS, and is titled *Proposed Comprehensive Transportation Plan in Support of the 2008 MIMP, October 1, 2008*. It contains elements to reduce congestion and other negative transportation impacts related to Children's growth. It addresses both regional and local impacts of the expansion. The following pages provide a summary of the strategies proposed by Children's including:

- Children's Design and Facilities – including campus design, near-site improvements and off-site parking
- Children's Enhanced Transportation Management Plan (TMP)
- Proposed Intersection Improvements
- Children's Contributions to Area Transportation Facilities – including corridor ITS and Northeast Seattle transportation, pedestrian and bicycle improvements

Children's Design and Facilities

Campus Design and Near-site Improvements

The campus design includes elements to support pedestrian accessibility, bicycle facilities, and transit centers. Together with the arrangement of buildings, the campus design is intended to support the convenience and attractiveness of alternative transportation modes. This campus design would blend with the surrounding neighborhood and include adjacent improvements on Sand Point Way NE, 40th Avenue NE, NE 45th Street and NE 50th Street (for Alternatives 3 and 6 only), to support vehicle and pedestrian movement near the campus, for both Children's transportation, and the surrounding neighborhood.

On-site improvements include:

- **Shuttle** – Development of a high quality shuttle hub to serve Children's shuttles and enhanced pedestrian connection to shuttles. Depending on the alternative selected, the

hub could become a combined transit/shuttle hub, to consolidate the arrival of these non-auto modes to Children's.

- **Transit** – Create a pedestrian-oriented building entrance proximate to the Route 75 transit stop. Develop an enhanced campus pathway to connect to the Route 25 transit stop. In the long term, work with Metro to co-locate Routes 25 and 75 at the same stop location.
- **Bicycle** – Add bicycle parking to accommodate up to 600 cyclists, focused in locations that facilitate access to desired on campus locations. Add shower and locker facilities to accommodate the anticipated level of demand.
- **Pedestrian –** Build a front door into the hospital campus and directly into the main hospital entrance off 40th Avenue NE. In addition, clear pedestrian flow patterns, both from adjacent neighborhoods, and within the campus, would be developed as a fundamental element of the site design through the Master Plan development process. Vehicle routes on campus would be designed to enhance the safety of pedestrians using the routes as well.
- **Redesign Penny Drive –** Penny Drive would be redesigned to provide designated spaces for pedestrians and bicycles, as well as automobiles.

Near-site improvements would compliment the on-site investments identified above, and include:

- **Transit** – Depending on the final alternative selected and the final location of transit stops, Children's will work with SDOT and WSDOT to reconfigure the intersection of 40th Avenue NE/Sand Point Way NE to create a priority for safe pedestrian crossing while balancing the capacity and vehicle circulation requirements.
- **Sand Point Way NE Intersections** – Improvements to intersections on Sand Point Way NE include the intersections with Penny Drive, 40th Avenue NE, and possibly NE 50th Street, depending on which alternative is selected.
  - **Penny Drive/Sand Point Way NE** – Enhancements at this location include the addition of a second left-turn lane from Penny Drive to Sand Point Way NE, and improvements to bicycle and pedestrian access across Sand Point Way NE.
  - **40th Avenue NE/Sand Point Way NE** – Children's will work with the City to install traffic signal at this location. A signal is in the current City plans, however, with the development of Children's, it would be desirable to develop a design that integrates with the planned main entrance scheme (depending on the alternative selected), as well as enhance pedestrian crossing safety.
  - **NE 50th Street/Sand Point Way NE** – A traffic ~~Alternatives 3 and 6~~signal ~~may be advisable based on a formal signal study conducted by SDOT~~would be required under Alternatives 3 and 6, pending a formal signal study by SDOT.
- **NE 45th Street Left-turn Lane** – If Alternative 7R or 8 is selected, it may be desirable to restripe NE 45th Street to accommodate a left-turn lane for eastbound to northbound turns (from NE 45th Street to 40th Avenue NE). This improvement could be accomplished through restriping and removal of a few on-street parking spaces.

- **Near-Site Pedestrian and Bicycle Environment** – Improve wayfinding and design to enhance the quality and number of pedestrian entrances.
- **Burke-Gilman Trail Connection** – Improve connectivity between trail and hospital through improved wayfinding and intersection enhancements. At Hartmann, connect the trail with the 40th Avenue NE crossing of Sand Point Way NE. This would increase the convenience for both pedestrians and cyclists.
- **Enhance Street Frontages** – For Alternatives 7R and 8, Children's will bring the buildings closer to the street, provide widened sidewalks, etc. This could also include retail on the first floor to provide activity in the sidewalk areas.

Mitigation Measure Effectiveness. The above improvements would, to varying degrees, enhance the safety and efficiency of travel for pedestrians and vehicles in the immediate site vicinity through enhanced signing, improved pathways, enhanced pedestrian environments, and improved traffic control at key entrances and nearby intersections. The traffic control along the site frontage would also be included in the ITS improvement described below, so the traffic signal timings and coordination between traffic signals would improve progression on Sand Point Way NE.

Off-Site Parking

As described in Appendix D, Attachment T-9, in addition to the level of mitigation proposed above, Children's remains committed to exploring new off-site parking and out-of-area remote parking. Successfully securing off-site parking would reduce the level of required parking development on-site. A number of benefits would derive from accomplishing this.

- **In Area Remote Parking**. This represents parking in locations consistent with Children's current practice. This includes Magnuson Park to the north and the University of Washington Montlake parking area (Lot E1) to the south. To the extent that this parking can serve trips from the north and south respectively, it results in a direct offset in traffic approaching the campus. Magnuson parking reduces impacts between the hospital and Magnuson Park on Sand Point Way NE to the north; University of Washington Lot E1 parking reduces impacts on NE 45th Street, and Sand Point Way NE to the south, including the five corners intersection.
- **Out-of-Area Remote Parking**. This represents the securing of parking in remote lots *outside the area of impact* identified in the EIS traffic impact analysis. This would include areas north of Magnuson Park and south of the Montlake Boulevard/SR 520 interchange area. To the extent that Children's locates parking completely outside the area of impact, the effect would be equivalent to achieving a greater transit mode split, facilitated by shuttle connections.

Mitigation Measure Effectiveness. To determine the effectiveness of this measure, a sensitivity analysis was conducted. It is estimated that for every 100 parking spaces that would be located out of area, a reduction in new PM peak hour trips of 5 to 10 percent would occur. This strategy could substantially reduce the level of unmitigated traffic impacts. If the off-site parking is located within the area of impact, then the reduction in impact would be less, but still of benefit to the segments of Sand Point Way NE near Children's, including the five corners intersection for parking located to the south.

Children's Enhanced Transportation Management Plan

Children's is proposing enhanced policies and programming for its TMP including extending Children's shuttle system to offer a new commute alternative. Existing shuttle service connects Children's with downtown Seattle and to off-site parking at Magnuson Park, the University of Washington campus, and other parking lots. These TMP enhancements would help achieve a 30 percent SOV mode split goal or lower among existing and future employees as measured under applicable TMP requirements.

- **Transit Shuttles.** Significant investment would be made in the operation of new shuttles from major transit hubs that connect riders directly to Children's. Shuttle routes would meet regional transit service hubs at 3rd Avenue/Westlake downtown, the University District, and the future light rail station at Montlake. Another additional route would likely provide connections from south Snohomish County during peak commute periods.
- **TDM Enhancements.** Children's would add new TDM services and programs, including increased commuter bonus awards for employees who do not drive alone to Children's.
- **Parking Management Policies.** Children's would increase the financial incentive not to drive alone by raising the cost of SOV parking and raising commuter bonus awards. In addition, Children's would reduce or eliminate free parking, allow pay-per-use parking, and assign staff to off-campus lots based on proximity to home addresses to further encourage non-SOV travel, reduce miles traveled by SOV, and potentially remove vehicles from the area affected by the Master Plan.

Table 3.10-13 shows a brief comparison of Children's existing and proposed enhanced TMP. The impact analysis assumes continuation of the existing TMP for the "unmitigated" condition and implementation of the enhanced TMP for the "mitigated" condition.

Mitigation Measure Effectiveness. The effectiveness of the proposed TMP measures were evaluated using US Environmental Protection Agency COMMUTER Model (v2.0), a widely accepted mode split model for forecasting future SOV rates and related trip reductions. Based on this, the proposed TMP program as outlined in Appendix D, Attachment T-9 would result in a 30 to 40 percent reduction to the unmitigated new PM peak hour traffic from Children's.

Table 3.10-13
Comparison of Existing and Enhanced Transportation Management Programs

Existing Program	Proposed Enhancements
Shuttle Service and Facilities	
Shuttle fleet of **12 vehicles**	Increase shuttle fleet to support service ~~**21 vehicles**~~
6 Weekday Routes to/from campus, off-site parking, other Children's facilities, and affiliated institutions [2]	**5 Additional Weekday Routes** to public transit hubs including U-District, 3rd Avenue/Westlake and Downtown Transit Tunnel, SR 520/ Montlake Boulevard Station, future Husky Stadium light rail station, and south Snohomish County
Shuttle stop at Giraffe Building	Transportation hub with 4 to 6 bus bays with integrated pedestrian circulation between bays and hospital
Route 75 bus stop at Penny Drive/Sand Point Way NE and Route 25 bus stop at turnaround on NE 45th Street	Pedestrian-oriented entrance adjacent to bus stop and directional guides to riders along a path; or create a combined hub at Sand Point Way/40th Avenue NE
Transportation Demand Management	
Incentives for Alternate Commutes	
Up to **$50 per month** in Commuter Bonus for employees and hospital physicians	Up to **$65 per month** and include residents, fellows, and students as eligible
Rideshare matching, reserved parking for vanpools and carpools, additional quarterly bonuses for vanpool drivers, backup drivers, and bookkeepers; $65 per month for full time carpooling	Continue existing program proportionate to growth of staff and invest in technology that facilitates rideshare matching by commuters themselves, including real-time matching
FlexPass for all Children's employees and hospital physicians / PugetPass upon request	FlexPass extended to residents and fellows, and UPass subsidized for students
Showers, lockers, secure bike parking, and free bike tune-ups	Flexbike program – short time one-way electric-assist bicycle rentals Company bike program – provide bicycles free of charge to employees who commit to commute by bicycle $100 per year gear bonus for biking
Umbrellas and reflective lights for walking	$100 per year gear bonus for walking
Supportive programs	
Guaranteed Ride Home (GRH) and car sharing memberships	Continue existing program proportionate to growth of staff and investment in Zipcar as population grows
Parking Management	
Assignment to on and off-site parking by **seniority and position** for employees. Residents and fellows park on-site.	Off-site parking **assignments** based on **home address** (begun in March 2008). Day-shift residents and fellows assigned to off-site.
Parking officer and security staff monitor speeds, direct traffic, and enforce parking, including parking at off-site lots. Parking in neighborhood is forbidden, and enforced by checking license plates and issuing warnings/tickets.	Children's should invest in technology to allow daily charges for visitors and patients, control access to visitor lots, and more tightly manage on-site parking supply
Employees, hospital physicians, Pace temps, travelers, UW employees, and contractors who drive alone charged **$50 per month** for parking	Raise on-site parking charge to **$65 per month** and add students, residents, and fellows to employees charged for parking
Patient families, carpools, vanpools, residents, students, fellows, volunteers, community physicians, trustees, board members and vendors **park free**	**Eliminate free parking** and replace with pay-per-use. Allow for potential validation or Medicaid vouchers for patient families.

Source: Children's, October 2008

Proposed Intersection Improvements

~~In addition to the mitigation measures discussed above,~~ Section 3.10.2, Impacts identified the following mitigation measures:

- **40th Avenue NE/NE 55th Street** - Children's would contribute their fair share to the future installation of traffic signals at this intersection. The City should monitor this intersection to determine the timing of the mitigation implementation. This mitigation would result in future (2030) LOS A operations during the AM peak hour and LOS B operations during the PM peak hour for the Build Alternatives.
- **40th Avenue NE/NE 65th Street** - Children's would contribute their fair share to the future installation of traffic signals at this intersection. The City should monitor this intersection to determine the timing of the mitigation implementation. This mitigation would result in future (2030) LOS A operations during both the AM and PM peak hours for the Build Alternatives.

Children's Contributions to Area Transportation Facilities

NE 45th Street/Montlake Boulevard Intelligent Transportation Systems (ITS)
In addition to the trip reduction achieved through its enhanced TMP, Children's will make a direct contribution of $500,000 to build ITS improvements through the corridor from Montlake Boulevard/NE 45th Street to Sand Point Way NE/NE 50th Street. These ITS projects would benefit all road users (not just Children's-generated traffic) by improving vehicle flow and travel times in response to changing traffic conditions. This would fund and extend the ITS improvement identified by the City in the UATAS.

ITS projects use technology to optimize signal coordination and signal timing, utilizing traffic cameras and variable message signs. ITS projects typically do not require right-of-way or major physical improvements; therefore they can often be implemented more quickly than other types of improvements. Because they do not require significant construction, they result in minimal traffic disruption on the affected corridors. In addition to benefitting peak hour traffic conditions, they also improve corridor travel at other times during the day and on weekends. The contribution would be used to:

- Install a detection system that measures congestion along southbound Montlake Boulevard, linked to smart traffic control devices that adapt to traffic conditions
- Install variable message signs to give real-time traffic information to drivers, including travel time estimates, updates on collisions and other traffic conditions, and to implement variable speed limits throughout the day in order to keep traffic flowing as smoothly as possible
- Optimize signal coordination and timing to move vehicles most efficiently and optimize intersection performance
- Upgrade signal controllers as needed to allow signals to be interconnected
- Install traffic cameras as identified by the City of Seattle

Mitigation Measure Effectiveness. Practice-based research indicates that ITS enhancements result in between 10 and 45 percent improvement in functional street capacity or performance[5]. For example, at Greenwood Avenue N and Holman Road NW in Seattle, an ITS implementation has led to a measured 30 percent reduction in vehicle delay and a 15 percent reduction in travel time. While it is inappropriate to model such improvements when dealing with long-range forecasts, even achieving improvement on the low end of the range above would represent a level of improvement that largely offsets the identified impact of Children's added traffic on corridor operations.

Northeast Seattle Transportation Improvements

The traffic impact analysis identified impacts to traffic congestion on NE 45th Street and Montlake Boulevard. These corridors have experienced peak period congestion for many years. While Children's added traffic would impact calculated travel times, the corridors are forecast to continue to be congested in the future with or without the proposed expansion of Children's. These traffic conditions were studied by the City as part of the UATAS and other studies. No single solution to reduce peak hour delay for general traffic has been identified through these studies. Transportation improvements have focused on efforts to enhance safety and walkability for pedestrians, to invest in improvements that facilitate transit service and efficiency, and optimize the performance of the corridors in their current configuration (Intelligent Transportation Solutions).

Children's has committed to funding a pro rata share of Northeast Seattle Transportation improvement projects that were identified from the UATAS, Sand Point Way NE Northeast Pedestrian Study, and the City of Seattle Bicycle Master Plan. The pro rata methodology was used consistent with methods employed by the City when calculating pro rata in other neighborhoods including South Lake Union and Northgate. It is based on comparing the PM peak hour traffic associated with the master plan expansion of Children's to the total PM peak hour traffic forecast for 2030. The list of potential projects and methodology used as the basis for pro rata is included in Appendix D, Attachment T-9, Table 7.

Based on current estimates, Children's pro rata contribution would total approximately $1,400,000, or approximately $3,955 per new bed added (assuming up to 354 additional beds) by Children's over the course of the master plan development. While the obligation was calculated by determining partial shares of many projects, it is anticipated that actual implementation would be determined by SDOT, and directed at funding high priority projects in the affected subarea. Thus, the proposed pro-rata portion of the mitigation can be viewed similar to a transportation impact fee of $3,955 per new bed.

Mitigation Measure Effectiveness. A pro-rata based "impact fee" is an effective way to address the impact of added Children's traffic on the Northeast Seattle transportation system, and develop an equitable basis for contributing to the City's vision for future transportation in Northeast Seattle. The level of obligation is determined through a pro rata, which is commonly accepted basis for addressing impacts under SEPA, as the level of mitigation is proportional to the level of impact identified. By affording the City the flexibility to allocate the funds to the

[5] The potential level of benefit for ITS was determined based on a review of a variety of sources including research from the United States Department of Transportation, Federal Highway Administration *Traffic Signal Timing Manual*, Transportation Research Board, and Pima Association of Governments - Tucson, AZ.

highest priority projects, greater improvement is likely to result. As these funds are prioritized, it is expected that they would be concentrated by the City on the NE 45th Street and/or Montlake Boulevard transportation improvements, as those are the corridors where the impacts of Children's traffic is the highest.

Northeast Seattle Pedestrian and Bicycle Improvements

Children's proposes to provide $2,000,000 of funding for pedestrian and bicycle improvements in Northeast Seattle over the timeframe of the master plan development. Children's proposes these funds to support alternative travel mode choices throughout the surrounding neighborhoods, and expects that they would also compliment their aggressive TMP goals. Children's would work with the City, community members, and pedestrian and bicycle advocates to identify potential improvements. The following represent potential categories to guide the investments in bicycle and pedestrian infrastructure improvements that Children's could consider funding:

- **Bicycle Master Plan Priority Projects**. These funds could be allocated to five projects, and include adding sharrows or bike lanes along significant sections of 20th Avenue NE, Ravenna Place, 35th Avenue NE, and NE 65th Street.
- **Connections from Children's to Larger Bike/Pedestrian Networks**. These projects are focused on improving safety, wayfinding and connectivity between Children's and regional pedestrian facilitates like the Burke-Gilman Trail. As shown on Table 9 of Appendix D, Attachment T-9, connections includes sidewalks on sections of 41st Avenue NE, NE 50th Street, and Sand Point Way NE, and the installation of clear wayfinding signs to and from Children's and Sand Point Way NE to the Burke-Gilman Trail.
- **Bicycle Boulevards**. Children's proposes some of its funding into the development of bicycle boulevards in Northeast Seattle. The proposal is consistent with Children's stated core mission of the hospital to enhance children's safety and welfare. In addition, it is consistent with enhancing travel options for bicycle and non-auto modes to and from Children's and within the surrounding neighborhoods. The specific routes would be planned in collaboration with City staff and the community.

Mitigation Measure Effectiveness. These improvements were identified by Children's not to offset an identified significant adverse impact to pedestrian or bicycle safety, but to enhance safety and accessibility for all modes of travel to and from the hospital, and within the surrounding neighborhoods. Appendix D, Attachment T-9 identifies more specific benefits of each of the improvements; overall, the improvements would result in benefits to pedestrian and bicycle safety, while also encouraging increased use of these modes by Children's employees, patients, and visitors, as well as the general public.

~~It contains two elements: a transportation management plan and capital improvements. It addresses both regional and local impacts of the expansion, as well as impacts that occur due to the No Build Alternative. The TMP strategy is designed to reduce the number of vehicles coming to Children's. The capital improvements are intended to improve operations and safety for vehicles, as well as pedestrian and bicycle mobility and safety to encourage alternative forms of travel.~~

~~**Transportation Management Program**~~

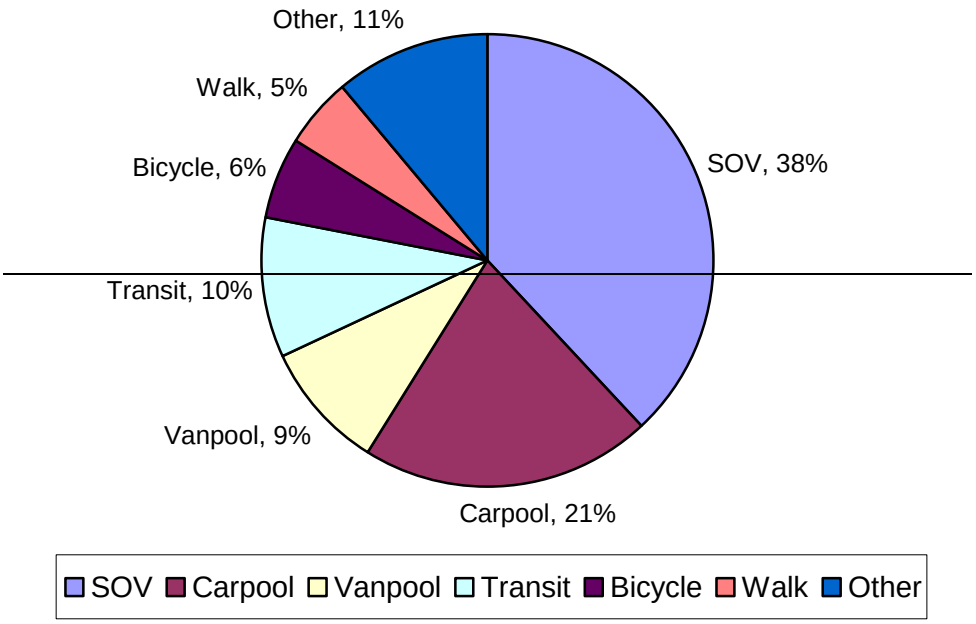
~~Children's dedicates staff to implement programs to reduce travel demand, manage parking, and other related programs. The current TMP is achieving a commuter SOV rate of 38 percent.~~

~~Children's TMP is an agreement between the City of Seattle, King County Metro, and Children's whereby all parties agree to use their resources to provide maximum energy conservation as it relates to employees commute trips to and from Children's. The agreement was first signed and implemented in 1985 and has been updated several times, with the latest update occurring in 2002. The primary purpose of the TMP is to reduce the number of SOV trips through the use of incentives.~~

~~The 2006 CTR survey demonstrated that less than 38 percent of affected day-shift staff drive alone to work, a number that has been reduced by approximately three percent over the past several years. Figure 3.10-13 shows the mode split by affected employee as reported by the CTR survey (CHRMC 2006).~~

~~***TMP Goal***~~

~~The proposed TMP enhancements are expected to result in an additional reduction in the percent of employees driving alone to work, leading to an SOV mode split of about 30 percent or lower among daytime employees at MIMP build out. For comparison, this meets or exceeds the 30 percent SOV goal set for the University District Urban Village in the City of Seattle's Comprehensive Plan.~~



~~Source: Children's 2006~~
~~Notes: SOV = single occupancy vehicle; Other includes telecommute, compressed work week, etc.~~

~~**Figure 3.10-13**~~
~~**Employee Mode Splits Based on 2006 CTR Survey**~~

~~***TMP Strategies***~~
~~The TMP is comprised of three primary strategies:~~

- ~~**Transit Shuttles.** Significant investment would be made in the operation of new shuttles from major transit hubs that connect riders directly to campus. Shuttle routes would meet regional transit service hubs at 3rd Avenue/Westlake downtown, the University District, and the future light rail station at Montlake. Another additional route would likely provide connections from south Snohomish County during peak commute periods.~~
- ~~**TDM Enhancements.** Children's would add new TDM services and programs, including increased commuter bonus awards for employees who do not drive alone to campus.~~
- ~~**Parking Management Policies**. Children's would increase the financial incentive not to drive alone by raising the cost of SOV parking and raising commuter bonus awards. In addition, Children's would reduce or eliminate free parking, allow pay-per-use parking, and assign staff to off-campus lots based on proximity to home addresses to further encourage non-SOV travel, reduce miles traveled by SOV, and potentially remove vehicles from the area impacted by the Master Plan.~~

~~**Capital Improvements**~~

~~Children's proposed capital investments are intended to improve person travel and mobility, consistent with the City of Seattle and subarea transportation goals. This strategy is separated into three parts, as follows:~~

~~**Regional - Critical Corridor Strategy – Subarea Safety and Mobility Study**. [Children's traffic would contribute to cumulative congestion on the Montlake Boulevard and NE 45th Street corridors. The overall impact on travel time between Children's campus and I-5 via NE 45th Street, and between Children's campus and SR 520 via Montlake Boulevard was calculated to be approximately three additional minutes for both corridors. Children's proposes to provide $500,000 to fund a Subarea Safety and Mobility Study, led by the City of Seattle, on these corridors. This study would focus on developing solutions that improve person-movement capacity, person travel time, and safety. In addition, Children's proposes to contribute a share of the actual dollars required to fund projects resulting from this study~~

~~**Local - Other Pedestrian and Bicycle Improvements**. Children's proposes to provide up to $2,000,000 to fund the construction and implementation of projects that promote bicycling and walking. These projects are identified in Table 5 of Appendix D, Attachment T-9. They would result in improved access and safety in using the Burke-Gilman Trail, enhanced safety in crossing Sand Point Way NE, and other improvements.~~

~~**On Site – Site Plan Considerations**. Capital improvements included as part of the site design are:~~

~~-developing an on-site transportation center to serve non-SOV travelers~~

~~-constructing larger shuttle bus bays with capacity for up to four to five shuttles on-site simultaneously~~

~~-designing clear pedestrian circulation and pathways between building destinations and transportation connections~~

~~-providing storage facilities and amenities for approximately 600 bicycles with secured bicycle parking and shower/locker facilitates in the transportation center, or near the bottom of the hill to provide convenient access for riders~~

~~**Other Transportation Mitigation**~~

~~•**Montlake Boulevard NE/NE 45th Street** - Children's would contribute their fair share to future signal timing improvements at this intersection. The City should monitor this intersection to determine the timing of the mitigation implementation. Provision of future signal timing adjustments at this location would improve operations to LOS D during the PM peak hour for the Build Alternatives.~~

~~•**Sand Point Way NE Right-in/Right-out Driveway Emergency Access** – For Alternative 7, Children's is proposing a median break with an actuated emergency vehicle-only traffic signal to accommodate southbound emergency vehicle traffic. This access would require removal of a portion of the existing median to accommodate emergency left-turning vehicles into the site.~~

3.10.10.3 Phase 1

Based on a review of phasing impacts, there would be a level of mitigation necessary to support each phase of development. The following mitigation measures are for Phase 1 and highlight programs and capital improvements that could be implemented to offset impacts. A detailed discussion on these mitigation measures is presented in Appendix D, Attachment T-9. Mitigation measures for subsequent Children's phases would be evaluated as Children's applies for permits over the 20-year development of the master plan.

- Children's Design and Facilities - Children's will implement all of the proposed physical improvements such as the near-site pedestrian and bicycle improvements along the project frontage during Phase 1. All of the service improvements would occur proportional to anticipated Phase 1 growth (e.g. bicycle lockers, number of shuttles, number of off-site parking stalls).
- Children's Enhanced TMP - Children's will implement measures to meet their proposed SOV mode split for Phase 1
- Proposed Intersection Improvements - Children's will contribute their share as calculated by the City, to the installation of a traffic signal at the 40th Avenue NE/NE 55th Street intersection. The City should monitor this intersection to determine the timing of the mitigation implementation.
- Children's Contributions to Area Transportation Facilities – Children's will contribute funds to the NE 45th Street/Montlake Boulevard ITS projects and to Northeast Seattle transportation, pedestrian and bicycle facility improvements in an amount proportional to Phase 1 development

3.10.11 Significant Unavoidable Adverse Impacts

The development proposed under all Build Alternatives would contribute to additional traffic and congestion along Sand Point Way NE, NE 45th Street, and Montlake Boulevard, and increased traffic accessing and circulating in the area. This added congestion would increase travel delays along several of the corridors and at some specific intersections.

3.10.11.1 Street System

No significant unavoidable impacts to the street system were identified.

3.10.11.2 Traffic Volumes

Future (2030) growth in the area would result in increases in regional and local traffic within the study area both without and with the project. In addition, the Build Alternatives would increase area-wide and local traffic on routes serving the site. The determination of whether the increase in traffic volume is significant is analyzed as part of its ~~a~~effect on traffic operations (the impact of added volumes on overall delay, travel times, capacity of corridors, or other factors deemed relevant by decision makers). See "Traffic Operations" below.

3.10.11.3 Traffic Operations

Implementing the proposed mitigation could reduce the increased travel times and intersection delays for peak hour traffic across the Montlake Boulevard and NE 45th Street corridors that would result from the Build Alternatives. It is anticipated that a 40 to 60 percent improvement in travel time could be achieved as a result of this mitigation.

~~There are a number of factors that may contribute to improvement of future traffic operations in the study area, however the results are unknown at this time. These include the implementation of Children's proposed Safety and Mobility Plan, Children's commitment to funding their share of the recommendations that come forth from that plan, and the final configuration of SR 520 and its interface with Montlake Boulevard. In consideration of all of these factors, the addition of Children's traffic to the street system, even with a successful TMP that results in reduced traffic demand, could result in changes to traffic operating conditions that would be considered significant.~~

3.10.11.4 Traffic Safety

No significant adverse impact to safety would occur. With the proposed mitigation, it is probable that overall safety would be enhanced.

3.10.11.5 Parking

No significant unavoidable impact to parking would occur.

3.10.11.6 Non-Motorized Facilities

Children's would provide pedestrian and bicycle enhancements at the hospital and Hartmann site, as well as at near-site intersections and along Sand Point Way NE. In addition, improved connections to the Burke-Gilman Trail have been identified. No significant unavoidable adverse non-motorized impacts are expected.

3.10.11.7 Shuttle and Transit Services

Children's is in the process of enhancing its existing shuttle services and is exploring expanded shuttle service to accommodate future needs. In addition, Children's has partnered with King County Metro to ensure adequate transit service to the hospital and would continue to form these partnerships in the future. No significant unavoidable adverse shuttle and transit service impacts are expected.

3.10.12 Secondary and Cumulative Impacts

Secondary and cumulative impacts on area roadways are included in the analysis of direct impacts.

No significant off-site or on-site traffic volume or operation impacts are expected as a result of phasing and construction separately; however, there is a potential for cumulative impacts due to traffic being generated by build-out of the project and construction. This potential impact could

be mitigated by scheduling construction activities such that arrival and departure of construction traffic occurs outside the peak hours.

PAGE INTENTIONALLY LEFT BLANK

3.11 Public Services and Utilities

3.11.1 Affected Environment

Services currently being provided to Children's include fire, police, water, sewer, stormwater, and solid waste. For a discussion on natural gas and electricity, please see Section 3.4, Energy and Natural Resources.

3.11.1.1 Fire

The Seattle Fire Department provides fire protection services to Children's through Battalion #6. Nearby facilities and equipment are shown in Table 3.11-1 and include three fire stations.

Table 3.11-1
Fire Station Resources Near Children's

Station	Assigned Battalion	Address	Fire Suppression	
17	6	1050 NE 50th Street	Engine Company Ladder Truck	Battalion Chief Reserve aid car
38	6	5503 33rd Avenue NE	Engine Company Reserve engine	
40	6	9401 35th Avenue NE	Engine Company Reserve engine	

Services are provided on a first-available unit basis. It is likely that an initial response to Children's would be from Station 38. While peak traffic flows can slow fire response, the Fire Department indicated no extraordinary delays to serve Children's or the northeast Seattle area. There are alternative routes defined to avoid congestion.

Fire Department inspections are part of the department's fire prevention services. Children's conducts fire drills according to state and local regulations. Fire drills are conducted quarterly on all shifts in each building with ambulatory and health care occupancy and at least 50 percent are unannounced. The effectiveness of fire response training according to the fire plan is evaluated at least annually and drills are critiqued to identify deficiencies and opportunities for improvement.

The Children's facilities, except for the existing landscape facilities buildings and modular trailers, are Type I construction, which is the most fire resistive form of construction. Children's has a combination of smoke detectors, heat detectors, manual pull stations and sprinklers, which cover the entire facilities (except the landscape facilities building and small maintenance buildings). The fire alarm system is currently monitored by Siemens Protection Services who summon the fire department in the event of an alarm as a back-up measure. Fire drills are conducted in varying locations throughout the hospital once a shift per quarter.

3.11.1.2 Police

Children's is located within the North Precinct, Sector "U-3," which extends from NE 65th Street to the Ship Canal and Montlake Boulevard/25th Avenue NE to Lake Washington. The Seattle Police Department provides necessary public safety services and also compiles beat activities and crime statistics. Table 3.11-2 shows a profile of police beat activity in Census Tract 41, in which Children's is located, and compares it to the city as a whole. Police activity included responses to about 233 calls in 2006. This represents approximately 1.3 percent of the North Precinct total and approximately 0.5 percent of the city total, based on Part I offenses (Part I offenses include major crimes, such as murder, rape, aggravated assault, and theft).

Table 3.11-2
Summary of 2006 Part 1 Offenses Around Children's

Offense	Census Tract 41	Total Seattle
Murder	0	30
Rape	1	127
Robbery	2	1,667
Aggravated Assault	2	2,322
Residential Burglary	31	5,417
Non-Residential Burglary	16	2,087
Theft	139	23,911
Auto Theft	40	8,138
Arson	2	234
Total Part I Offenses	**233**	**43,933**

Source: Seattle Police Department 2006 Crime Stats

Children's security is currently provided by its own Security Department. Security staff are on duty 24 hours a day, every day of the year. The services they provide include escort service to and from the parking areas, lost and found, confrontational situation control, loss prevention, identification badge making and issuing, and parking assignment and enforcement.

Safety is the responsibility of every Children's employee, but is continuously monitored by the Hospital Safety Committee and Risk Management Department. Accidents are all reviewed and applicable corrective actions are taken. The facilities also are monitored continuously for unsafe conditions or practices, which are corrected whenever found.

3.11.1.3 Maintenance

Sand Point Way NE is the primary arterial serving Children's. This road is classified by the City of Seattle as a principal arterial. As defined by the Seattle Department of Transportation, roads

classified as principal arterials can be "transportation arteries which connect the focal points of traffic interest within a city; arteries which provide communications with other communities and the outlying areas; or arteries which have relatively high traffic volume compared with other streets within the city."

3.11.1.4 Water/Sewer/Stormwater

Seattle Public Utilities supplies water to 1.3 million businesses and people in the region, including Children's. In 2004, users of the Seattle Regional Water System consumed approximately 140 millions of gallons per day, or approximately 51 billion gallons per year. Water service to Children's is supplied through two 8-inch water mains, one from Sand Point Way NE and one from NE 45th Street. The water pressure at Children's is 80 pounds per square inch, which is within normal operating parameters. Currently Children's domestic and irrigation water demand is around 45,000,000 gallons of water per year.

Sewer service to Children's is provided by the City of Seattle Public Utilities Department. Children's is served by public sewer mains located in Sand Point Way NE (12-inch pipe), NE 45th Street (8-inch pipe) and NE 45th Street (8-inch pipe). These mains combine at the intersection of 40th Avenue NE and NE 45th Street, where the line becomes a 30-inch pipe. The size and slopes of these mains provides the local area with sufficient sewer service. For commercial businesses like Children's, sewer bills are based on actual water usage at all times of the year. The City allows medical waste in the form of liquid body fluids to be flushed into the sewer system.

Stormwater service is provided through the Seattle Public Utilities Department. Drainage fees are collected through property taxes and not through a utility bill. Starting on January 1, 2008, stormwater rates will be charged by 1,000 square feet on the site and not per acre. Rate charges will vary depending on property size and the amount of impervious surfaces.

3.11.1.5 Solid Waste

Solid waste and recycling service to Children's is served by Rabanco/Allied Waste Services through a City of Seattle partnership. Allied Waste Services does accept unsaturated gloves/paper/cloths in their regular solid waste service. Waste from the Seattle area, including from Children's, is disposed of in the Roosevelt Regional Landfill, located in Klickitat County. From October 2006 to September 2007, Children's generated 963.99 tons of solid waste and 339.75 tons of recycling.

Medical waste generated by Children's is picked up biweekly by Stericycle, the only Washington Utilities and Transportation Commission permitted medical waste-hauler in the state. The cost is determined per pound. From October 2006 to September 2007, Children's generated 149 tons of medical waste.

Children's has recently elected to follow the Green Guide for Health Care, which is a "best practices guide for healthy and sustainable building design, construction, and operations for the healthcare industry." Children's is currently on track to meet the 2008 Green Guide for Health Care goal of a 25 percent reduction in total waste, using 2007 as a baseline. Gradual reductions in waste generated would be expected.

3.11.2 Impacts

3.11.2.1 Fire and Police

Alternative 1

A slight increase in the need for fire protection and police services would be expected with Alternative 1 with any minimal increase in patients and visitors that would be using any facilities added under the existing master plan. The City fire and police departments would continue to meet needed service levels.

Alternatives 3, 6, ~~and~~ 7R and 8

If one of these alternatives were selected, there would be a minor impact due to an increased need for fire protection and police services to serve the increase in patients, visitors and staff. The Hartmann site would be redeveloped with Alternatives 3, 6 or 7R to a larger size which would result in an increased amount of fire and police calls above existing levels. With Alternatives 7R or 8, the existing 136 units of Laurelon Terrance would be replaced with new hospital buildings, replacing the existing wood-frame construction with Type 1 construction. The City fire and police departments would continue to meet needed service levels.

3.11.2.2 Maintenance

All Alternatives

Selection of any of the alternatives would increase the amount of trucks serving Children's, both during construction and operation. However, as Children's would be required to receive City of Seattle approval of its haul routes prior to construction, adverse impacts would be minimal. No impacts to streets are anticipated with the increased number of delivery and service trucks entering Penny Drive from Sand Point Way NE.

See Section 3.10, Transportation for more information and Section 3.11.3 on proposed measures to maintain streets during and after construction.

3.11.2.3 Water/Sewer/Stormwater

Alternative 1

No impacts to water, sewer, or stormwater utilities would be expected with Alternative 1.

Alternatives 3, 6, ~~and~~ 7R and 8

Selection of any of the build alternatives could increase the demand up to 112,000,000 gallons of water consumption annually; this would be a minor impact. With Alternatives 7R or 8, there would be a decrease in water and sewer use from the removal of the Laurelon Terrace units that would minimally offset the increase in usage for the expanded hospital. There would be adequate capacity in the current system to handle an increase in water consumption and sewer and stormwater discharge.

As the water pressure in the public system is static, Children's neighbors would not experience changes in their water pressure. The only time a reduction in water pressure could be noticed is during a fire flow event. This project would not have any impact on current water services or local domestic water pressure. No new or expansion of City water or sewer pipes to serve Children's is expected.

3.11.2.4 Solid Waste

All Alternatives

Selection of any of the alternatives would result in an increase in solid waste production. However, as there would be adequate capacity in the current solid waste system to handle the increased amount of solid waste generated, no adverse impacts would be expected.

3.11.3 Mitigation Measures

3.11.3.1 Construction

- Children's would consult the Fire Department to plan fire access routes to and on site, particularly during construction phases.
- Fire flow requirements and hydrant location/capacities would be reviewed with the Fire Department to ensure adequate capacity.
- The construction plan and haul routes to be used by trucks would be submitted to the City of Seattle prior to approval of each phase of construction.
- All applicable City requirements regarding construction and operational truck routes would be followed.
- Contractors would be required to document street pavement conditions prior to, during, and after construction of each phase to ensure no significant street degradation.

3.11.3.2 Operation

- Children's would continue to follow Police Department recommended guidelines, which include providing adequate lighting and clear lines of sight, using transparent security screening rather than opaque walls, and designing to avoid creating hiding places for criminal activity or increased crime risk.
- Children's projects would comply with all applicable fire prevention guidelines and life safety codes and requirements.
- Children's would continue its water conservation programs, both in grounds maintenance and facility operations. Specific landscape measures include drought-tolerant plantings, computerized controller units for irrigation, zone control watering, and efficient spray nozzles with more uniform water distribution. Facility operational measures to conserve water include efficient flush valve fixtures, water restrictors, conservation education, and water recycling.

3.11.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts are expected after mitigation.

3.11.5 Secondary and Cumulative Impacts

The build alternatives in combination with population growth in the city of Seattle would increase the demand on public services and utilities; however, each of the identified public services and utilities has the capacity to accept an increase without adverse affects.

Section 4 - References

Child Health Corporation of America (CHCA). 2007. *Epidemiological Drivers of Inpatient Care*.

Children's Hospital and Regional Medical Center (CHRMC). 2006. Commute Trip Reduction Survey.

———. 2007. Major Institution Master Plan - Concept Plan. August 3.

———. 2008a. Major Institution Master Plan – Draft Plan. June 9.

———. 2008b. Major Institution Master Plan – Preliminary Final. August 29.

———. 2008c. Major Institution Master Plan – Preliminary Final. September 25.

Federal Highway Administration (FHWA). 2003. *Manual on Uniform Traffic Control Devices for Streets and Highways* Including Revision 1 dated November 2004 and Revision 2 dated December 2007.

Gunston, Bill. 1980. *The Encyclopedia of World Air Power*. The Hamlyn Publishing Company Limited. London. Consulting editor.

Neff, John. 2007. *A New Taxonomy: Identification-Classification of Patients by Underlying Conditions*. National Association of Children's Hospitals and Related Institutions (NACHRI) Annual Meeting presentation. Director of the Center for Children with Special Needs. October.

Pascua, Rod. 2007. CDi Engineers. Email to Julie Blakeslee, URS Corporation. December 12.

Puget Sound Regional Council. 2006. *Puget Sound Trends No. D11*. May.

_____. 2007. *Puget Sound Trends No. D7*. February.

Seattle Department of Design, Construction & Land Use (Seattle DCLU). 1996. *Addendum to: EIS for Children's Hospital & Medical Center, Major Institution Master Plan -- A & B-Wing Bed Renovations*. May 10.

———. 2001. *EIS Addendum for the Proposed Parking Garage -- Children's Hospital & Regional Medical Center*. January 25.

———. 2002. *EIS Addendum for the Proposed Inpatient Wing -- Children's Hospital & Regional Medical Center*. March 21.

———. 2003a. *EIS Addendum for the Ambulatory Care Building -- Children's Hospital & Regional Medical Center*. June 9.

———. 2003b. *EIS Addendum for the Emergency Department/Operating Room -- Children's Hospital & Regional Medical Center*. January 30.

Seattle Department of Transportation (Heffron Transportation). 2007. Sand Point Way Pedestrian Study. December 28.

——— (Mirai Associates). 2008. University Area Transportation Action Strategy 2007-2030. August.

Transportation Research Board. 2000. *Highway Capacity Manual*.

US Census Bureau. 2000. *US Census, Summary File.*

US Environmental Protection Agency. *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources.* Fifth Edition.

Weant, Robert A. and Herbert S. Levinson. 1990. *Parking*. Eno Foundation for Transportation, Washington, DC. Reprinted 2003.

WSDOT. 2008. SR 520 Bridge Replacement and HOV Project (drawings). March 10.

———, FHWA and Sound Transit. 2006. SR 520 Bridge Replacement and HOV Project – Draft EIS. August 11.

Section 5 - Glossary

Air emissions. Gas emitted into the air from industrial and chemical processes, such as ozone, carbon monoxide, nitrogen oxide, nitrogen dioxide, sulfur dioxide and others.

Air pollutant. Any substance in air that could, in high enough concentration, harm humans, other animals, vegetation or material. Pollutants may include almost any natural or artificial composition of airborne matter capable of being airborne. They may be in the form of solid particles, liquid droplets, gases or a combination thereof. Generally, they fall into two main groups: 1) those emitted directly from identifiable sources; and 2) those produced in the air by interaction between two or more primary pollutants, or by reaction with normal atmospheric constituents, with or without photoactivation. Exclusive of pollen, fog and dust, which are of natural origin, about 100 contaminants have been identified and fall into the following categories: solids, sulfur compounds, volatile organic chemicals, nitrogen compounds, oxygen compounds, halogen compounds, radioactive compounds, and odors.

Air quality standards. The level of pollutants prescribed by regulations that may not be exceeded during a given time in a defined area.

Ambulatory care. Any medical care delivered on an outpatient basis.

A-weight. A standard frequency weighting to stimulate the response of the human ear.

Building footprint. Outline of building perimeter at grade.

Congestion. A condition characterized by unstable traffic flows that prohibit movement on a transportation facility at optimal legal speeds. Recurring congestion is caused by constant excess volume compared with capacity. Nonrecurring congestion is caused by unusual or unpredictable events such as traffic accidents.

Cumulative effect. The effects on the environment that result from the incremental consequences of an action when added to other past, present and reasonably foreseeable future actions.

Elevation. Measurement from sea level; for this project, often at the face of a building.

Emission. Pollution discharged into the atmosphere from smokestacks, other vents and surface areas of commercial or industrial facilities, and from residential and mobile sources.

Environmental impact statement (EIS). A document that identifies and analyzes, in detail, environmental impacts of a proposed action. As a tool for decision-making, the EIS describes positive and negative effects, and lists alternatives for an undertaking.

Floor area ratio. A ratio expressing the relationship between the amount of gross floor area permitted in a structure and the area of the lot on which the structure is located

Grade. The natural surface contour of a lot. Grade can be modified by minor adjustments to the surface of the lot in preparation for construction.

Greenhouse gases. Greenhouse gases (GHGs) are the gases present in the earth's atmosphere which warm near-surface global temperatures through the greenhouse effect. The principal greenhouse gases are carbon dioxide, NOx, methane, and three groups of high-warming potential gases—hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

Height. Measurement from grade.

Impervious surface. Surface through which water cannot percolate.

Leq. Equivalent sound level. The level of a constant sound which, in a given time period, has the same energy as does in a time-varying sound.

Level of service (LOS). A gauge for evaluating system performance for roadways, non-motorized and other transportation modes. For example, roadway measures of level of service often assign criteria based on volume-to-capacity ratios.

Lot coverage. That portion of a lot occupied by the principal structure and its accessory structures, expressed as a percentage of the total lot area.

Major Institution. An institution providing medical or educational services to the community. A Major Institution, by nature of its function and size, dominates and has the potential to change the character of the surrounding area and/or create significant negative impacts on the area. To qualify as a Major Institution, an institution must have a minimum site size of sixty thousand (60,000) square feet of which fifty thousand (50,000) square feet must be contiguous, and have a minimum gross floor area of three hundred thousand (300,000) square feet. The institution may be located in a single building or a group of buildings which includes facilities to conduct classes or related activities needed for the operation of the institution.

A Major Institution shall be determined to be either an educational Major Institution or a medical Major Institution, according to the following: (1) "Educational Major Institution" means an accredited post-secondary level educational institution, operated by a public agency or nonprofit organization, granting associate, baccalaureate and/or graduate degrees. The institution may also carry out research and other activities related to its educational programs. (2) "Medical Major Institution" means a licensed hospital.

Major Institution Overlay (MIO). According to the Seattle Municipal Code, an MIO District shall overlay existing zoning to regulate appropriate institutional growth within the boundaries.

Medical Major Institution. A licensed hospital.

Medical service. A retail sales and service use in which health care for humans is provided on an outpatient basis, including but not limited to offices for doctors, dentists, chiropractors, and other health care practitioners. Permitted accessory uses include associated office, research and laboratory uses.

Mitigation measures. Actions taken to reduce adverse effects on the environment, usually implemented under the State Environmental Policy Act.

MUP. Master Use Permit. The document issued to a project applicant, recording all land use decisions made by the DPD on a master use application. The term excludes construction permits and land use approvals granted by the City Council, by citizen boards or by the state.

National Ambient Air Quality Standards (NAAQS). Standards established by the US Environmental Protection Agency that apply to outside air quality throughout the country.

Nitrogen oxide. A gas formed by combustion under high temperature and high pressure in an internal combustion engine. Changes in nitrogen dioxide in the ambient air contributes to photochemical smog.

Non-attainment area. Area that does not meet one or more of the National Ambient Air Quality Standards for the criteria pollutants designated in the Clean Air Act.

Non-conforming use. A non-conforming use is a use that does not conform to today's Land Use Code, but was lawful when it was established, and has been use continuously since that time.

Open space, landscaped. Exterior space, at ground level, predominantly open to public view and used for the planting of trees, shrubs, ground cover and other natural vegetation.

Open space, usable. An open space which is of appropriate size, shape, location and topographic siting so that it provides landscaping, pedestrian access or opportunity for outdoor recreational activity. Parking areas and driveways are not usable open spaces.

Peak hour. The period of the day during which the maximum amount of travel occurs.

Residential Parking Zone (RPZ). A street designation and permit system that limits on-street parking by nonresidents.

State Environmental Policy Act (SEPA). State legislation passed in 1974, which establishes an environmental review process for all development projects and major planning studies prior to taking any action on these projects. SEPA permits early coordination to identify and mitigate any significant issues or impacts that may result from a project or study.

Setbacks. The minimum required distance between a structure and a lot line.

SOV. Single Occupant Vehicle means a motor vehicle occupied by one (1) person, excluding motorcycles.

Transportation Management Program (TMP). A required set of measures to reduce a project building's demand on transportation infrastructure. These measures typically seek to discourage commuting via single-occupant vehicle and encourage alternative commute modes. TMPs must be approved by DPD, SDOT, and the owner of the project building as a condition of the project building's Master Use Permit.

PAGE INTENTIONALLY LEFT BLANK

Section 6 - Final EIS Distribution List

The following agencies and organizations received notice of the availability of this Final EIS.

Federal Agencies:	Environmental Protection Agency, Region X Department of Housing and Urban Development, Region X Centers for Medicare and Medicaid Services, Region X U.S. Department of Transportation, Federal Aviation Administration
State of Washington:	Department of Ecology Department of Health Department of Social and Health Services Department of Transportation Department of Community Development Governor of the State of Washington Office of Archaeology & Historic Preservation Department of Trade and Economic Development
Regional Agencies:	King County Metro, Environmental Planning Puget Sound Clean Air Agency Puget Sound Regional Council
City of Seattle:	Department of Planning and Development Department of Neighborhoods Department of Parks and Recreation Fire Department Office of Economic Development Office of the Mayor Police Department Seattle City Light Seattle Design Commission Seattle-King County Department of Health Seattle Public Utilities Seattle Department of Transportation
Utility Companies:	Puget Sound Energy Seattle Steam Corporation Qwest
Libraries:	Seattle Public Library - Central and North East Branches
Newspapers:	Seattle Times Seattle Post Intelligencer

	Daily Journal of Commerce
Special Interest:	Children's Major Institution Master Plan Citizen Advisory Committee
Groups:	Airlift Northwest Burke Gilman PDA Board Children's Hospital & Regional Medical Center City University Citizens Advisory Committee Greater University Chamber of Commerce Harborview Medical Center Hawthorne Hills Community Club King County Emergency Medical Services Advisory Committee King County Medical Society Laurelcrest Condominiums Laurelhurst Community Club Laurelhurst West Condominiums Laurelon Terrace Condominium Association League of Women Voters Montlake Community Club Ravenna-Bryant Community Association Ravenna Springs Community Council Sand Point Community Communication Committee University District Community Council University Neighborhood Service Center University of Washington Facilities Management Office University of Washington Medical Center View Ridge Community Club Washington State Hospital Association Washington State Medical Association Windermere Corporation 70th and Sand Point Way Advisory Committee