



PCN19-0007 Vicinity Map



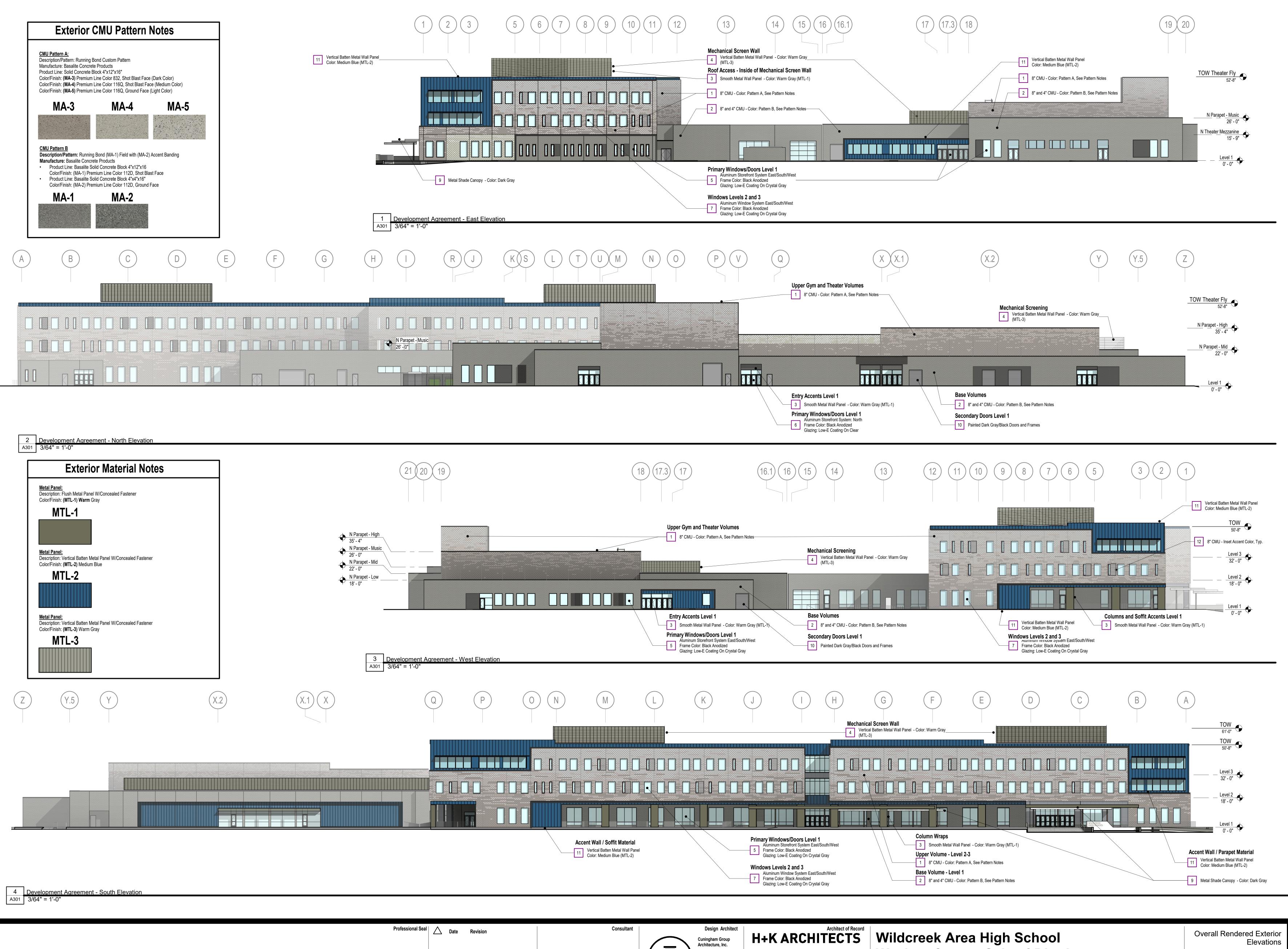


Exhibit 2





H+K ARCHITECTS

5485 Reno Corporate Drive, Suite 100
Reno, Nevada 89511-2262

P 775+332+6640
F 775+332+6642

hkarchitects.com

Wildcreek Area High School
Washoe County School District
Sullivan Lane

Sparks, Nevada 89431



Exhibit 3



Traffic Engineering, Transportation Planning & Forensic Services

January 31, 2019

Adam T. Searcy, P.E. Washoe County School District 14101 Old Virginia Road Reno, NV 89521

RECEIVED-CITY OF SPARKS

FEB 2 2 2019

COMMUNITY SERVICES
ADMINISTRATION

Parking Analysis for the High School at Wildcreek Project

Dear Mr. Searcy,

This letter report summarizes the results of a parking analysis conducted for the High School at Wildcreek project. The purpose of this analysis is to determine the amount of parking that should be provided at the proposed high school to adequately accommodate typical school days and special events. Parking demand data was collected from multiple sources including the Institute of Transportation Engineers (ITE), City of Sparks Development Standards, Washoe County Development Code, and new count data collected at Washoe County School District (WCSD) high schools. The proposed project consists of a high school that would serve 2,125 students and approximately 150 faculty located north of North McCarran Boulevard and east of Sullivan Lane on a portion of the existing Wildcreek Golf Course property.

PARKING GENERATION RATES

Parking Generation, ITE

Parking Generation, 4th Edition, published by the Institute of Transportation Engineers, includes parking rates to determine the number of parking spaces recommended for different land use types. The following rates are provided for a High School in a suburban setting during the average weekday peak period:

- Average Peak Period Parking Demand: 0.23 vehicles per student
- Range: 0.14 0.31 vehicles per student
- 85th Percentile: 0.25 vehicles per student

The ITE data is based on eight (8) study sites with an average of 1,170 students per site.

Based on the average peak parking demand and a projection of 2,125 students, the proposed project would need to provide approximately 489 parking spaces.

City of Sparks and City of Reno

The City of Sparks Code of Ordinances includes Development Standards established for all development in the City. Section 20.04.009C provides the "Number of Off-Street Parking Spaces Required" based on land use type. Additionally, the City of Reno's Land Development Code includes Off-Parking Requirements for new development projects. The following number of parking spaces are required by the City of Sparks and the City of Reno for a High School:

 1 space for each 1.5 students, faculty, and staff based on design capacity (i.e. 0.67 spaces per student, faculty, and staff)

Based on this data and a projection of 2,125 students and 150 faculty, the proposed project would need to provide approximately 1,517 parking spaces. This is over one thousand more spaces than recommended by ITE data.

Washoe County

Table 110.410.10.1 - Off-Street Parking Space Requirements of the *Washoe County Development Code* includes the following parking space requirements for different types of land uses. The "Education" category is split into two subcategories – "College/University" and "Elementary/Secondary." The parking space requirements for an Elementary/Secondary school are as follows:

- 1 space per employee during peak employment shift
- 0.25 spaces per student of driving age

Based on this data and a projection of 1,594 students (assuming 3/4 of the students are of driving age) and 150 faculty, the proposed project would need to provide approximately 549 parking spaces.

DATA COLLECTION

Parking data was collected at several WCSD high schools during typical school days and during special events such as open houses and football games to develop WCSD specific parking rates. The following data was collected.

Typical School Day

Data was collected at the following three high schools during the middle of a mid-week day when classes were in session and the majority of students would be present. We did not collect data during the beginning or end of the school day, as some students may have periods off.

- Damonte Ranch HS Thursday, September 6, 2018
- Spanish Springs HS Wednesday, September 12, 2018
- North Valleys HS Thursday, September 13, 2018



Special Events

Data was also collected during five special events including two open houses/parent nights, and three football games, including two Homecoming games. The football games were selected based on anticipated maximum attendance (i.e. Homecoming games and games against local teams). We tried to avoid counting football games against teams from far away locations where visitor attendance would likely be minimal. Parking utilization data was collected at the following events:

- Galena HS Open House Wednesday, August 22, 2018
- Damonte Ranch HS Open House Wednesday, August 29, 2018
- Damonte Ranch HS Homecoming Football Game (vs. Spanish Springs HS) Friday, September 7,
 2018
- McQueen HS Football Game (vs. Carson HS) Friday, September 7, 2018
- North Valleys HS Homecoming Football Game (vs. Winnemucca) Friday, September 21, 2018

WCSD SPECIFIC PARKING RATES

Parking rates were calculated based on the data collection listed above. **Table 1** summarizes the data and detailed calculations are provided in **Attachment A**.

Table 1: WCSD Parking Data

High School	Event/Day	# of Cars Parked	Student Enrollment	Parking Rate (Cars Parked per Student)
Damonte Ranch	Typical Weekday	400	1818	0.22
Spanish Springs	Typical Weekday	1 469 1		0.19
North Valleys	Typical Weekday	352	2086	0.17
Galena	Open House	481	1451	0.33
Damonte Ranch	Open House	417	1818	0.23
Damonte Ranch	Football Game (Homecoming)	634	1818	0.35
McQueen	Football Game	501	1709	0.29
North Valleys	Football Game (Homecoming)	389	2086	0.19

As shown in the table, the parking rates range from 0.17 to 0.35 vehicles per student which is well below the City of Sparks' requirement of 0.67 spaces per student, faculty, and staff. The parking utilization at WCSD high schools was found to be very similar to ITE identified rates. The parking rates in **Table 1** account for associated staff/faculty as staff was present and utilizing parking spaces when the data was collected.



CONCLUSIONS & RECOMMENDATIONS

The following is a list of our key findings and recommendations:

- Based on the data collected at WCSD sites, special events typically result in higher parking demand than an average school day.
- Based on the data presented above, a parking supply rate of at least 0.35 spaces per student is recommended for the proposed project. This fits within the typical parking supply range for other WCSD high schools. As shown in **Attachment A**, WCSD typical parking supply rates range from 0.16 to 0.48 spaces per student. The range of parking supply rates for the newer schools of similar size/capacity to the proposed project is 0.32 to 0.41 spaces per student (highlighted in green).
- Based on a parking demand rate of 0.35 spaces per student and a projection of 2,125 students, a minimum of 744 parking spaces should be provided.
- A parking rate of 0.35 would provide more spaces than what is required by Washoe County Development Code and more than recommended by ITE.
- Although less than what is required by the City of Sparks and the City of Reno, a parking rate of 0.35 (i.e. minimum of 744 parking spaces) is expected to adequately accommodate the parking needs based on WCSD high school specific data.
- To be conservative and provide a buffer for any extraordinarily large events, we recommend adding a 20% buffer in the planned parking supply. This additional 20% results in a total recommended parking supply of 893 spaces.

Sincerely, TRAFFIC WORKS, LLC

LOJEN
LOJEN
CHILSON
THE
CIVIL
NO. 15619

Loren E. Chilson, PE Principal

Attachments: A - WCSD Specific Parking Data Calculations



Average Weekday Peak Period Parking

Location	Event/Day	# of Cars Parked	Enrollment	Cars Parked per Student	% of Spaces Filled
Damonte Ranch	Typical Weekday	400	1818	0.22	45%
Spanish Springs	Typical Weekday	469	2439	0.19	60%
North Valleys	Typical Weekday	352	2086	0.17	48%
			Average	0.19	
			85th Percentile	0.21	
			Maximum	0.22	

Event Parking

Location	Event	# of Cars Parked	Enrollment	Cars Parked per Student	% of Spaces Filled
Galena	Open House (Parent Night)	481	1451	0.33	73%
Damonte Ranch	Open House (Parent Night)	417	1818	0.23	47%
Damonte Ranch	Football Game (Homecoming)	634	1818	0.35	71%
McQueen	Football Game	501	1709	0.29	80%
North Valleys	Football Game (Homecoming)	389	2086	0.19	49%
			Average	0.28	
			85th Percentile	0.34	
			Maximum	0.35	

Existing WCSD Data as of October 2018

School		Parking Spaces		Faralla ant	Compoint	Familia.	Parking Spaces per
School	Regular	Handicapped	Total	Enrollment	Capacity	Faculty	Student Capacity
Damonte Ranch	855	33	888	1818	2170	128	0.41
Galena	637	22	659	1451	1893	103	0.35
Hug	374	14	388	1503	1904	161	0.20
Incline	137	4	141	290	882	44	0.16
McQueen	607	19	626	1709	1717	120	0.36
North Valley	701	26	727	2086	2282	154	0.32
Reed	1107	17	1124	2088	2330	157	0.48
Reno	460	12	472	1716	2162	115	0.22
Spanish Springs	768	19	787	2439	2312	163	0.34
Sparks	320	4	324	1188	1567	107	0.21
Wooster	542	17	559	1608	1796	142	0.31

31 January, 2019

Mr. Jon Ericson, P.E. City Engineer City of Sparks RECEIVED-CITY OF SPARKS

JAN 3 1 2019

COMMUNITY SERVICES

RE: Offsite improvements design and planning for Safe Routes To School at Wildcreek Area High School

* Jacqueline Calvert * Andrew Caudill * Scott Kelley * Ellen Minetto * Traci Davis, Superintendent

Dear Jon:

Safe Routes to School (SRTS) is an approach that promotes walking and bicycling to school through infrastructure improvements, enforcement, tools, safety education, and incentives to encourage walking and bicycling to school. Moving Ahead for Progress in the 21st Century (MAP-21) passed in 2012 making Safe Routes to School (SRTS) activities eligible to compete for funding alongside other programs, including the Transportation Enhancements program and Recreational Trails program, as part of a new program called Transportation Alternatives. Today, Washoe County School District (WCSD) receives federal funding for a full time SRTS Coordinator position within our School Police Department and this position is actively engaged in this program for all of our existing and new elementary and middle schools. This position has been filled for several years by Officer MJ Cloud at WCSD and her experience and professional judgement was consulted for the design of the upcoming Wildcreek Area High School. Additionally, WCSD has recently adopted "Board Policy 7400 - Conservation and Sustainability" which reads, in part, "Safe Routes To Schools. The District shall identify safe routes to schools and encourage walking and riding bikes to schools.".

In support of this approach and policy, WCSD Capital Project staff along with our consultant design team (Headway Transportation & Wood Rodgers) met with WCSD School Police Officer and SRTS Coordinator, MJ Cloud to discuss the appropriate offsite improvements associated with the development of the Wildcreek Area High School, relative to multi-modal access context typically considered during SRTS planning and design for Elementary Schools and Middle Schools. This new school site is anticipated to have an enrollment zone encompassing the existing Hug High School enrollment zone as well as the entirety of Sun Valley. During this discussion, we focused on Engineering Solutions available during construction to offsite improvements surrounding the proposed new school site.

Based on the initially recommended improvements as well as additional input from WCSD, the following improvements are being proposed as meeting the intent and objective of a healthy SRTS approach for this new school:

- New bicycle lanes in both directions along Sullivan Lane from El Rancho Dr. to McCarran Blvd.
- New sidewalk along the East side Sullivan Lane from El Rancho Dr. to McCarran Blvd.
- 15mph school zone with flashers installed near each proposed school access point on Sullivan Lane
- Strategically located crosswalks on Sullivan Lane at the proposed roundabouts
- Recommendation to coordinate with RTC Washoe to potentially relocate the current public bus route from El Rancho to Sullivan, providing a public bus stop along Sullivan in front of the school campus and greater accessibility to students



- New sidewalk, where currently absent, along the East side of El Rancho Drive from Sullivan Lane to Sun Valley Blvd, connecting to the multi-modal street improvements along Sun Valley Blvd currently under design by RTC Washoe
- New sidewalk connection along the North side of McCarran to the West of Sullivan Lane to connect to existing sidewalk (Approx. 670').
- New sidewalk to fill in current gaps along either Sullivan or alternatively El Rancho, in the segment South from McCarran Blvd to Wedekind Road (approx. 500 ft of infill on Sullivan Lane)

These proposed offsite improvements were developed in collaboration with and are endorsed by MJ Cloud, WCSD School Police SRTS Coordinator, as representing the spirit and intent of the tenants of the SRTS program. These improvements will be coupled with education and outreach efforts from within the school community to promote the education, health and safety of our students attending the school using multi-modal transportation.

Please let us know if you have any questions or require any additional information.

Sincerely

Adam T. Searcy, P.E.

Chief Facilities Management Officer Washoe County School District

775.789.3859 office | 775.354.60**0**7 cell

20 February, 2019 Mr., Jon Ericson, P.E. PTOE City Engineer, City of Sparks

RE: Proposed Open Campus operations at New High School at Wildcreek

Dear Jon:

During discussions regarding traffic analysis of the proposed Wildcreek Area High School between Washoe County School District and City of Sparks, the topic of an "open campus" versus a "closed campus" was considered.

* Jacqueline Calvert * Andrew Caudill * Scott Kelley * Ellen Minetto * Traci Davis, Superintendent

Generally speaking, both of these terms are used to describe an operations strategy employed by individual school Principals at their respective sites. Specifically, some of the WCSD high school Principals choose to manage their students with a policy whereby the students are not permitted to leave campus during their lunch period, except in valid, excused circumstances. Other school Principals allow for a more "free" or open campus operation wherein students often leave campus during their lunch period and return for remaining classes.

Currently, the Principals at Hug HS, Spanish Springs HS, North Valleys HS and Damonte Ranch HS all choose to manage their students through use of a "closed campus" operation. This is at the Principals' sole discretion, as is enforcement of such a restriction — which does vary across these sites. The new HS at Wildcreek is being designed with a sufficient kitchen and cafeteria so as to accommodate the anticipated lunch demands at this school should it be determined by a future Principal to be operated as a "closed campus".

However, the authority to operate this school as a closed or open campus resides with the future Principal(s) of this school and as such, it cannot be guaranteed by WCSD that this campus will always be operated in a "closed campus" format. While it is notable that the two schools which will be primarily rezoned to populate the New HS at Wildcreek (Hug and SSHS) are current closed campuses, that does not ensure that Wildcreek Area HS will be as well. Therefore, WCSD is requesting that the City of Sparks conservatively consider this new school to be operated in an "open campus" manner.

A traffic analysis of the anticipated impacts from this "open campus" operation will be provided under separate cover using data from WCSD Nutrition Services, input from WCSD Staff and conservative professional judgment.

Sincerely

Adam T. Searcy, P.E.

Chief Facilities Management Officer Washoe County School District RECEIVED-CITY OF SPARKS

FEB 2 0 2019

COMMUNITY SERVICES ADMINISTRATION





Date:

February 27, 2019

To:

Jon Ericson, PE, City of Sparks

From:

Loren Chilson, PE, Principal

Headway Transportation, LLC

Subject:

Level of Service Analysis (Lunch Hour) for High School at Wildcreek

Dear Mr. Ericson,

This memorandum documents the lunch hour level of service analysis conducted at the Sullivan Lane / McCarran Boulevard intersection for the High School at Wildcreek project.

Existing Traffic Volumes

Existing turning movement volumes were collected at the Sullivan Lane /McCarran Boulevard intersection on Thursday, February 21, 2019 between 11:30 AM and 1:30 PM with Washoe County School District schools in regular session. The turning movement volumes were factored up by 5% for seasonality. It is important to note that the existing traffic volumes on Sullivan Lane and McCarran Boulevard are less intense during the lunch hour compared to the morning or afternoon peak hours. **Exhibit 1** shows time of day roadway volumes (2017) at nearby NDOT count locations.

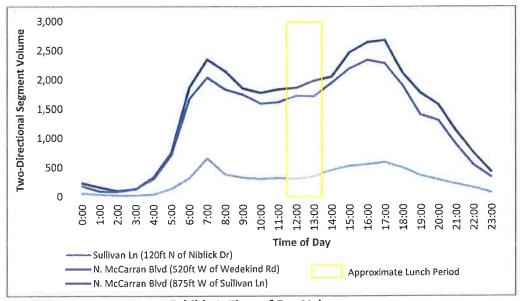


Exhibit 1. Time of Day Volumes

RECEIVED-CITY OF SPARKS

Headway Transportation, LLC 5482 Longley Lane, Suite B, Reno, Nevada 89511 775.322.4300 www.HeadwayTransportation.com

FEB 2 7 2019

the existing traffic volumes, project trips, and existing plus project traffic volumes. The mitigated lane configurations proposed in the Traffic Impact Study were used in this scenario. **Table 2** shows the intersection level of service results under Existing Plus Project conditions.

Table 2: Existing Plus Project Intersection Level of Service Results

de contrata de la companya de la contrata del contrata de la contrata del contrata de la contrata del contrata de la contrata de la contrata de la contrata del contrata de la contrata del contrata del contrata del contrata del contrata de la contrata del c	Ctu-l	Lower E	stimate ¹	Higher Estimate ²		
Intersection	ection Control		Delay ³	LOS	Delay ³	
McCarran Blvd / Sullivan Ln	Signal	С	30.1	С	33.6	

Notes:

- 1. Project Trip Generation Based on 221 Total Trips (113 Entry, 108 Exit)
- 2. Project Trip Generation Based on 382 Total Trips (191 Entry, 191 Exit)
- 3. The LOS and delay (sec/veh) results for the signalized intersections are based on HCM 2000 reporting because HCM 2010 does not support turning movement analysis with shared and exclusive lanes

Source: Headway Transportation, 2019

As shown in the table, the Sullivan Lane / McCarran Boulevard intersection is anticipated to operate at an acceptable level of service (LOS "C") under both Existing Plus Project scenarios. The technical calculations are provided in **Attachment B**.

Future Year (2040) Plus Project Level of Service Analysis

Intersection level of service analysis was performed using Synchro 9 analysis software consistent with the *High School at Wildcreek Traffic Impact Study* (Traffic Works, 2019). 2040 traffic volumes were developed using roadway segment volumes from the RTC's regional travel demand model. Base year and future year model volumes were used to develop growth rates for the study area roadways and intersections. The model volumes were adjusted upward assuming the worst case scenario that the Pyramid Highway/395 Connector might not be in place by 2040. **Figure 3** shows the future year (2040) traffic volumes, project trips, and future year (2040) plus project traffic volumes. The mitigated lane configurations proposed in the Traffic Impact Study were used in this scenario. McCarran Boulevard is anticipated to have 6 lanes consistent with the 2040 RTP. **Table 3** shows the intersection level of service results under Future Year (2040) Plus Project conditions.

Table 3: Future Year (2040) Plus Project Intersection Level of Service Results

had a seek and	Control	Lower E	stimate ¹	Higher E	stimate ²
Intersection	Control	LOS	Delay ³	LOS	Delay ³
McCarran Blvd / Sullivan Ln	Signal	С	30.9	С	34.1

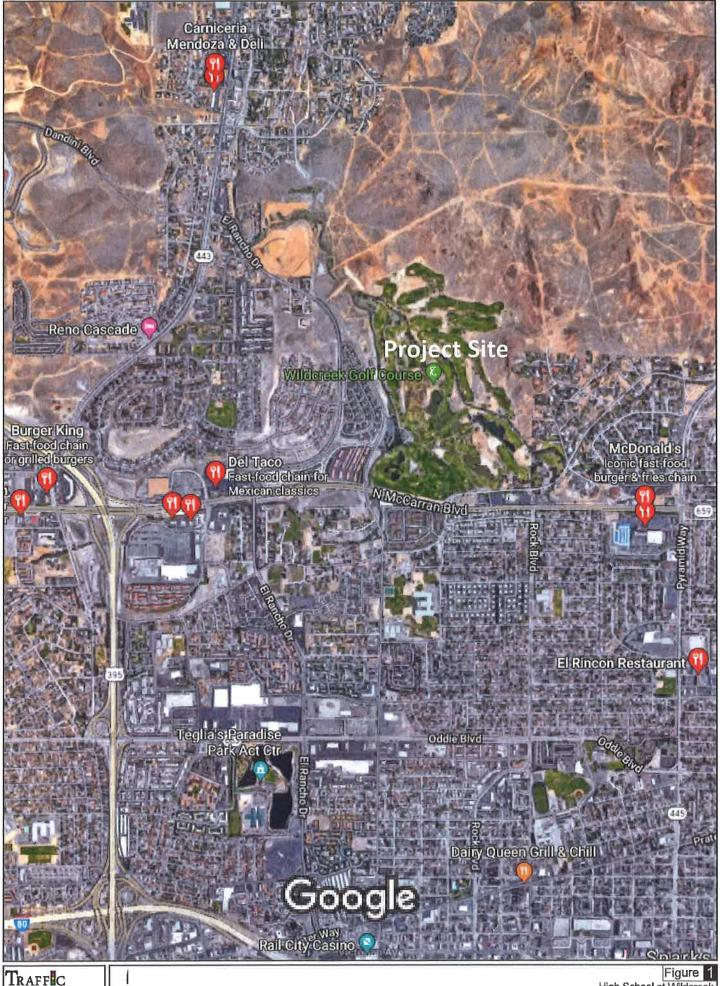
Notes:

- 1. Project Trip Generation Based on 221 Total Trips (113 Entry, 108 Exit)
- 2. Project Trip Generation Based on 382 Total Trips (191 Entry, 191 Exit)
- 3. The LOS and delay (sec/veh) results for the signalized intersections are based on HCM 2000 reporting because HCM 2010 does not support turning movement analysis with shared and exclusive lanes

Source: Headway Transportation, 2019

As shown in the table, the Sullivan Lane / McCarran Boulevard intersection is anticipated to operate at an acceptable level of service (LOS "C") under both Future Year Plus Project scenarios including the proposed mitigations. The technical calculations are provided in **Attachment C**.

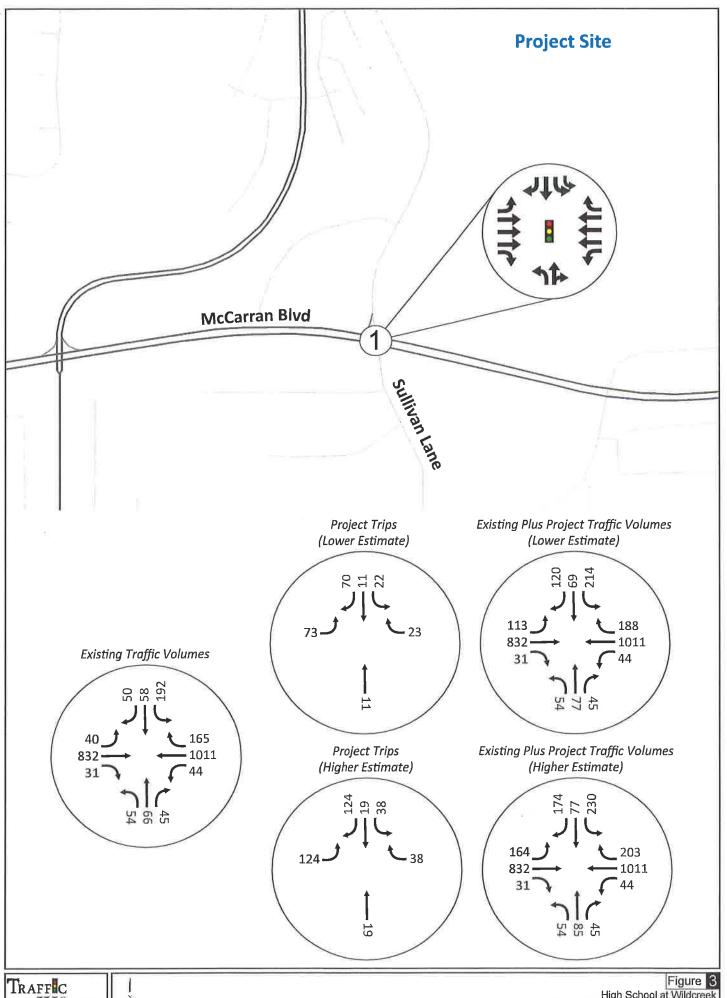






NO SCALE

Figure 1
High School at Wildcreek
Lunch Period LOS Analysis Memo
Lunch Destinations



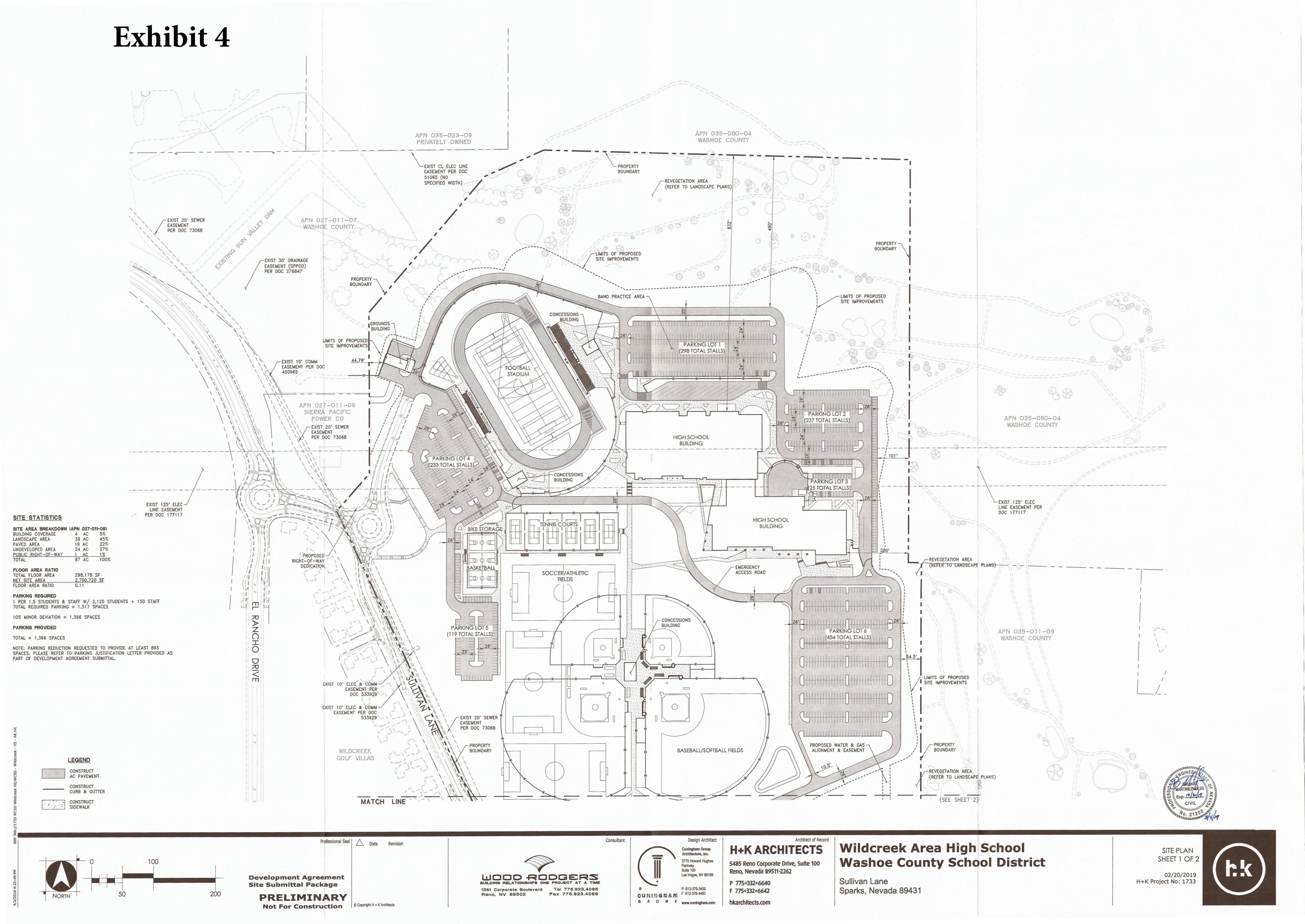
Traffic Warks

High School at Wildcreek
Lunch Period LOS Analysis Memo
2040 & 2040 Plus Project Traffic Volumes and Controls

	۶	→	*	1	+	•	4	†	*	-	ļ	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	N.	^	77	N.	个 个	7	7	7		144	^	ř
Traffic Volume (vph)	111	681	21	21	834	186	36	65	21	212	58	115
Future Volume (vph)	111	681	21	21	834	186	36	65	21	212	58	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3	6.6	6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1794		3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1794		3433	1863	1583
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	131	801	25	25	981	219	42	76	25	249	68	135
RTOR Reduction (vph)	0	0	11	0	0	104	0	12	0	0	0	122
Lane Group Flow (vph)	131	801	14	25	981	115	42	89	0	249	68	13
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	14.0	70.8	70.8	4.4	61.5	61.5	12.9	12.0		13.3	12.4	12.4
Effective Green, g (s)	14.0	70.8	70.8	4.4	61.5	61.5	12.9	12.0		13.3	12.4	12.4
Actuated g/C Ratio	0.11	0.56	0.56	0.03	0.49	0.49	0.10	0.10		0.11	0.10	0.10
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3	6.6	6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	196	1988	889	61	1727	772	181	170		362	183	155
v/s Ratio Prot	c0.07	0.23		0.01	c0.28		0.02	c0.05		c0.07	0.04	
v/s Ratio Perm			0.01			0.07						0.01
v/c Ratio	0.67	0.40	0.02	0.41	0.57	0.15	0.23	0.52		0.69	0.37	0.09
Uniform Delay, d1	53.8	15.6	12.2	59.5	22.8	17.8	52.0	54.3		54.3	53.2	51.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.5	0.6	0.0	1.6	1.4	0.4	0.2	1.3		4.3	0.5	0.1
Delay (s)	60.3	16.2	12.2	61.2	24.2	18.2	52.2	55.6		58.6	53.6	51.7
Level of Service	Е	В	В	E	C	В	D	E		E	D	D
Approach Delay (s)		22.2			23.9			54.6	-		55.8	
Approach LOS		С			C			D			E	
Intersection Summary			Sull'III		تتنس	Shirt.			100		chi"	0
HCM 2000 Control Delay			30.1	Н	CM 2000	Level of S	Service		C			E CVIII
HCM 2000 Volume to Capaci	city ratio		0.59									
Actuated Cycle Length (s)			126.0	S	um of lost	time (s)			25.5			
Intersection Capacity Utiliza	tion		57.4%	IC	U Level	of Service			В			
Analysis Period (min)			15									
c Critical Lane Group												

1: :	Sullivan	In &	McCarran	Rlvd
1000	Dunivan		MOGALIALI	DIVU

	*	-	*	•	←	*	4	†	-	-	↓	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ħ	ተተተ	70	79	ተተተ	r.	N.	P		1/4	^	P
Traffic Volume (vph)	113	832	31	44	1011	188	54	77	45	214	69	120
Future Volume (vph)	113	832	31	44	1011	188	54	77	45	214	69	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3	6.6	6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1760		3433	1863	1583
FIt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1770	1760		3433	1863	1583
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	133	979	36	52	1189	221	64	91	53	252	81	141
RTOR Reduction (vph)	0	0	18	0	0	105	0	20	0	0	0	126
Lane Group Flow (vph)	133	979	18	52	1189	116	64	124	0	252	81	15
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	12.3	63.3	63.3	9.4	60.7	60.7	14.4	14.4		13.4	13.4	13.4
Effective Green, g (s)	12.3	63.3	63.3	9.4	60.7	60.7	14.4	14.4		13.4	13.4	13.4
Actuated g/C Ratio	0.10	0.50	0.50	0.07	0.48	0.48	0.11	0.11		0.11	0.11	0.11
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3	6.6	6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	172	2554	795	132	2449	762	202	201		365	198	168
v/s Ratio Prot	c0.08	0.19		0.03	c0.23		0.04	c0.07		c0.07	0.04	
v/s Ratio Perm			0.01			0.07						0.01
v/c Ratio	0.77	0.38	0.02	0.39	0.49	0.15	0.32	0.62		0.69	0.41	0.09
Uniform Delay, d1	55.5	19.3	15.8	55.6	22,1	18.3	51.3	53.2		54.3	52.6	50.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	17.6	0.4	0.1	0.7	0.7	0.4	0.3	3.9		4.5	0.5	0.1
Delay (s)	73.1	19.8	15.8	56.3	22.8	18.7	51.6	57.1		58.8	53.1	50.9
Level of Service	E	В	В	Е	C	В	D	E		E	D	D
Approach Delay (s)		25.8			23.4			55.4			55.5	
Approach LOS		С			C			Е			E	
Intersection Summary		100									1,50	187
HCM 2000 Control Delay			30.9	Н	CM 2000	Level of S	Service		С	10.45		
HCM 2000 Volume to Capa	city ratio		0.57									
Actuated Cycle Length (s)			126.0	S	um of los	t time (s)			25.5			
Intersection Capacity Utiliza	ation		59,7%			of Service			В			
Analysis Period (min)			15									
c Critical Lane Group												



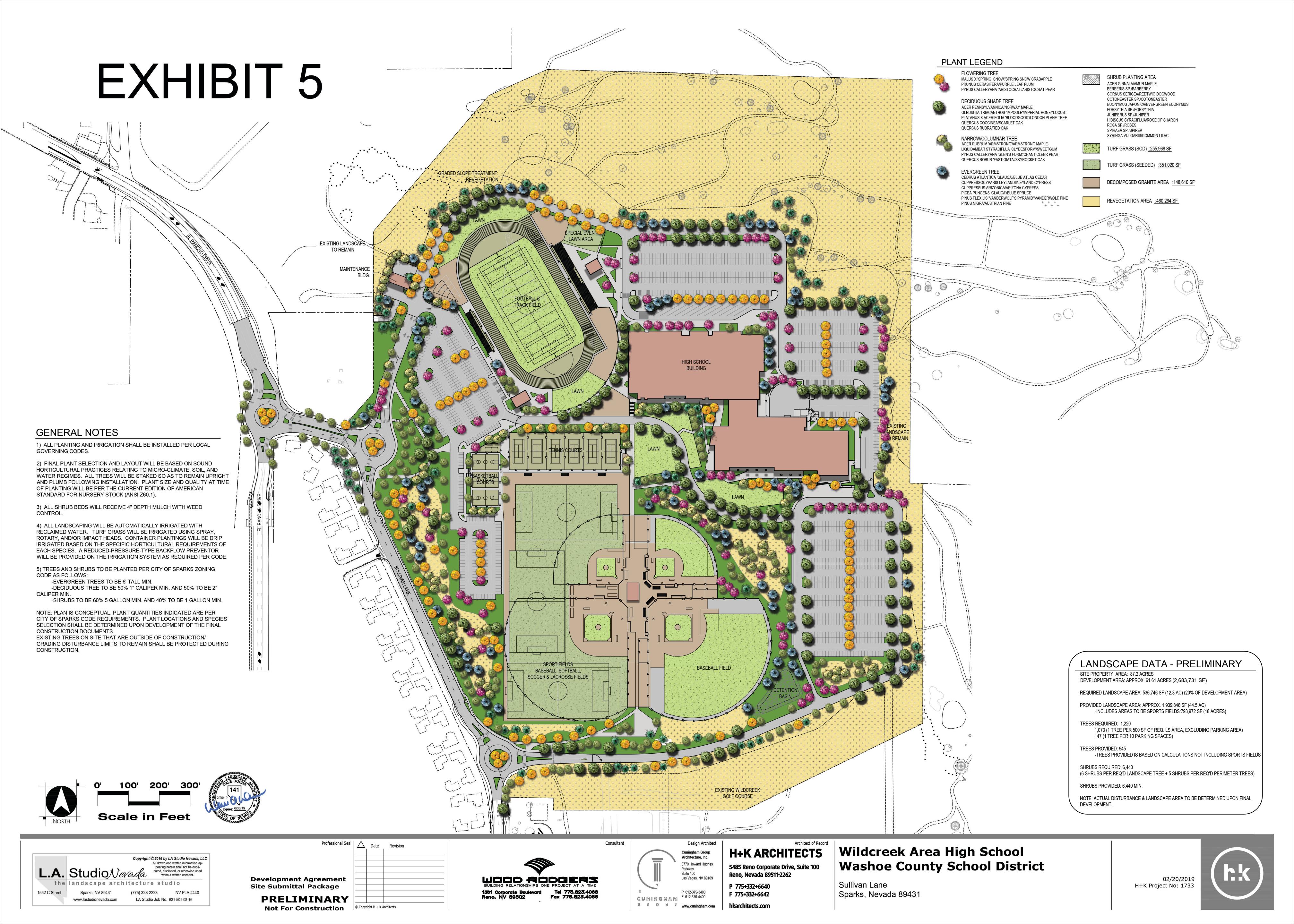


Exhibit 6



February 22, 2019

Mr. Adam Searcy, P.E. Washoe County School District 14101 Old Virginia Road Reno, Nevada 89521

Re: Sanitary Sewer Demand

Proposed High School at Wildcreek

Dear Adam:

At your request, we have had our subconsultant, Atkins, perform a preliminary evaluation of the City of Sparks sewer model and potential impacts related to the proposed sewer demand for the proposed high school at the Wildcreek site adjacent to Sullivan Lane in Sparks, Nevada.

The City of Sparks model was analyzed for the existing and buildout, or post-project, condition to determine if the proposed high school campus will negatively impact the existing system. Based on the proprosed buildings, areas, and uses the project is anticipated to contribute an average daily flow of 0.0061 million gallons per day (MGD). The buildout condition included the following:

- ☐ High School (285,000 SF)
- ☐ Home Stadium Concession Building (1,685 SF)
- ☐ Visitor Stadium Concession Building (1,980 SF)
- Existing Golf Clubhouse
- ☐ Grounds/Maintenance Building (2,440 SF)

The Atkin's study identified existing City of Sparks sewer system deficiencies in the existing condition in the 18th Street, Tyler Way, and Greenbrae sewer systems; many of these area and currently planned to be completed prior to the project connection date and those CIPs have been included in the project buildout model. Furthermore, it was determined that the increase (0.0061 MDG) resulting for the project was insignificant compared to the values of the existing system and the project alone would not trigger any of the identified capital improvement projects.

If you have any questions or need additional information, please do not hesitate to ask.

Sincerely,

WOOD RODGERS, INC.

Brian Martinezmoles, P.E.

Associate Engineer

Attachments: Capacity Analysis for the High School at Wildcreek Project

RECEIVED-CITY OF SPARKS

FEB 2 2 2019

COMMUNITY SERVICES ADMINISTRATION

Memo

То:	Brian Martinezmoles, P.E. Wood Rodgers	
From:	Brian Janes, P.E., Atkins	94 - 2 ⁵
Date:	February 7, 2019	
Subject:	Wildcreek Project - Capacity Analysis City of Sparks Sewer Model Update (Revision 1)	

Revision 1

- The square footages noted in Table 1 for home and visitor's stadium were previously misstated and have been corrected. The flows identified and results of the analysis were correct.
- Analysis has been revised to include CIPs 1 and 2 as an existing condition at the request of the City of Sparks.

Per the request of Wood Rogers, Atkins performed a preliminary capacity analysis of the existing sanitary sewer system downstream of the proposed Wildcreek Project (herein referred to as the "Project"). The purpose of this analysis was to determine the potential impacts to the existing sanitary sewer system resulting from the anticipated Project. This potential redevelopment project is planned to encompass multiple parcels (APNs: 027-011-05 and 035-080-04) at the current location of the Wildcreek Golf Course, located north of North McCarran Boulevard and east of Sullivan Lane (see attached **Figure 1**). These sewer flows enter the hydraulic model at manhole SSN029855. This memorandum summarizes the preliminary findings.

Wastewater Flows and Hydraulic Model

In modeling the wastewater generated from the proposed development, Atkins used specific historical water use data for similar properties around the City and assumptions on return-to-sewer ratios. This approach differs from the methods used in other post-master plan capacity analysis memorandums due to the specific and unique nature of the proposed development plan. **Table 1** below summarizes the estimated wastewater flows generated from the new development and compares to the estimated flows generated from these parcels under the planned land use designation reflected in the buildout model of the *2016 Sewer Model Update Technical Report* (2016 SMU). In the sewer model, the current development was classified as Park/Open Space and was assumed to not contribute flow to the sewer system, as the sewage flows from the golf course clubhouse were considered relatively negligible. As shown in **Table 1**, the Project's updated development plan increases the average daily buildout flow by approximately 0.0061 MGD compared to the original buildout land use.

Table 1 Wastewater Generation Model Loading Comparison

Proposed Development Land Use ¹	Average Daily Flow (gpd) ²	2016 SMU Planned Land Use	Average Daily Flow (gpd)
High School (285,000 sqft.)	5,486	Park/Open Space (330.8 ac)	0
Home Stadium Building - concessions (1,685 sqft.)	31		
Visitor Stadium Building - concessions (1,980 sqft.)	38		
Golf Course/ Clubhouse	500		
Grounds Maintenance Building (2440 sgft)	22		

Total ADWF = 6077 Total ADWF = 0

Memo

Notes:

¹ Buildout land use area data based on an estimate provided by Wood Rogers

² Average daily flow estimates based on historical winter-use water use data (assuming 100% return-to-sewer flows) for comparable developments in the Truckee Meadows:

High School - used Spanish Springs High School SSHS water use data as comparable. Used the 3rd quartile (9th highest value of 11) monthly value from 2015 and assumed SSHS to be 400,000 sqft. Calculated ADWF per square foot.

 Home Stadium Building – assumed some flow generated from concessions and used SSHS ADWF per square foot.

 Visitor Stadium Building – assumed some flow generated from concessions and used SSHS ADWF per square foot.

Golf Course/Clubhouse - used current Wild Creek Golf Course clubhouse as comparable. Used the 3rd quartile (9th highest value of 11) monthly value from 2015 and calculated ADWF per square foot.

 Grounds Maintenance Building- used Industrial ADWF generation rate recommended in Table 3-7 of the 2016 Sewer Model Update Technical Report

ADWF = average daily dry weather flow

These wastewater flows were loaded into the current version of a City of Sparks InfoSWMM hydraulic model (originally completed by Atkins, November 3, 2016 as part of the 2016 SMU). The following model scenarios were simulated to determine the impact of the project: (1) existing condition dry weather flow (DWF) and wet weather flow (WWF) models (including the anticipated flows from the Project) and (2) buildout condition dry and wet weather flow models (including the anticipated flows from the Project).

This study is a revision to the Wildcreek Project-Capacity Analysis study, completed for the City of Sparks in 2017 and again for Wood Rodgers on January 18, 2019. The 2017 Wildcreek study had a larger development footprint, with an ADWF of 0.0392 MGD. In comparison, this study has a smaller development footprint, with an ADWF of 0.0061 MGD. The ADWF has been significantly reduced and the Project will have a lesser effect on the capacity of the sewer system, compared to the 2017 Wildcreek study.

Additionally, at a meeting with the City of Sparks on February 1, 2019 CIPs 1 and 2 from the 2016 SMU were discussed. It was determined that CIP 1 had already been constructed and that CIP 2 would be constructed in FY2020. Considering that the Wildcreek Project construction is scheduled for FY2022, both CIPs were added to the modelling as an existing condition. CIPs 3 and 4 were not added as their construction is more uncertain and are scheduled in FY2021-22. A brief summary of the CIPs are as follows:

<u>CIP 1</u> (see Figure 5-2 in the 2016 SMU): CIP 1 includes upsizing the existing sewer in El Rancho Drive to 12-inch and 15-inch PVC and ultimately connecting a new system to the Reno Sparks Joint Interceptor near G Street. Included in this CIP is the abandonment of the connection between the El Rancho sewer system and the Greenbrae sewer system, which alleviates pressure on the downstream Greenbrae system and ultimately reduces the number of CIP improvements required in the Greenbrae system. Although this CIP is technically not downstream of the proposed development, it is required to help reduce CIPs and free up capacity in the sewer system downstream of the proposed development. This CIP is estimated at approximately \$1,477,810.

• <u>CIP 2</u> (see Figure 5-2 in the 2016 SMU): CIP 2 includes upsizing the 18th Street and Tyler Way sewers to 15-inch PVC. This CIP is estimated at approximately \$871,640.

 <u>CIP 3</u> (see Figure 5-4 in the 2016 SMU): CIP 3 includes upsizing the Quail Street and Boise Drive sewers to 24-inch PVC. The abandonment of the connection to the Probasco Way sewer system is also included in this CIP to alleviate pressure on the Probasco system and reduces the magnitude of improvements required in the downstream portions of the Probasco system. This CIP is estimated at approximately \$888,235.

<u>CIP 4</u> (see Figure 5-4 in the 2016 SMU): CIP 4 includes upsizing the Prater Way sewer to 15-inch or 18-inch PVC and upsizing the N McCarran Boulevard sewer to 30-inch PVC. This CIP is estimated at approximately \$1,974,105.

Existing Condition Model Results

Figure 2 compares the d/D modeling results for the sewer system between the existing condition scenario in the 2016 SMU and the existing condition plus the proposed development with CIPs 1 and 2 scenario to determine the potential downstream capacity impacts from the development. The existing condition plus the proposed development scenario includes the estimated ADWF of 0.0061 MGD from the Project in the model simulation. The criteria used to evaluate the sewer system are listed in Table 4-6 of the 2016 SMU.

The top half of **Figure 2** summarizes the d/D results for the existing condition without project condition from the 2016 SMU and shows approximately 2,800 linear feet of criteria violations in the 18th Street and Tyler Way sewer systems with additional criteria violations further downstream in the Greenbrae system (approximately 7,000 linear feet).

The construction/addition of CIPs 1 and 2 and the added 0.0061 MGD from the Project are shown in the bottom half of **Figure 2**. The criteria violations within the 18th Street and Tyler Way areas are no longer present with one exception. At this location the violation is minor and an improvement of approximately 0.1 d/D from the existing condition. Note that this remaining minor criteria violation is expected to be eliminated in FY2021-22 with the construction of CIPs 3 and 4. The additional flow from the Project does not impact this pipe segment. A model run performed showed an increase of 0.002 d/D from the Project which is negligible and within the uncertainty associated with the modelling software.

Buildout Condition Model Results

Figure 3 compares the d/D modeling results for the sewer system between the original buildout condition scenario in the 2016 SMU and the buildout condition with the proposed development with CIPs 1 and 2 scenario to determine the potential future downstream capacity impacts from the development. The criteria used to evaluate the sewer system are listed in Table 4-6 of the 2016 SMU.

Similar to the existing condition scenario, **Figure 3** shows that the criteria violations in the 18th Street and Tyler Way area have been eliminated with the exception of two pipe segments where minor violations remain, but are an improvement from the base buildout condition of approximately 0.1 d/D. Again, these remaining two minor criteria violations are expected to be eliminated in FY2021-22 with the construction of CIPs 3 and 4. The additional flow from the Project does not impact these pipe segments either as a model run performed showed an increase of 0.001 d/D from the Project which is negligible and within the uncertainty associated with the modelling software.

Conclusions

Addition of the identified project as described does not violate criteria or increase the d/D values in the downstream system. The remaining criteria violations noted in all scenarios are primarily due to existing sewer capacity deficiencies noted in the 2016 SMU.

Notes:

- CIPs noted in the 2016 SMU are at the planning level stage and require thorough engineering design to determine more accurate costs, alignments and other design components. The combination of these four CIPs are expected to resolve the existing condition violations for the system downstream of the development.
- In the buildout scenario, the 2016 SMU also identifies CIPs 17 and 19 (see Figure 5-12 and Figure 5-13, respectively) for this region, however this proposed development alone would not trigger either of those CIPs. CIPs 17 and 19 are needed for the regional development.
- 3. The Wildcreek Project does not cause any new criteria violations, and the negligible increases in d/D values are within the modelling software uncertainty.

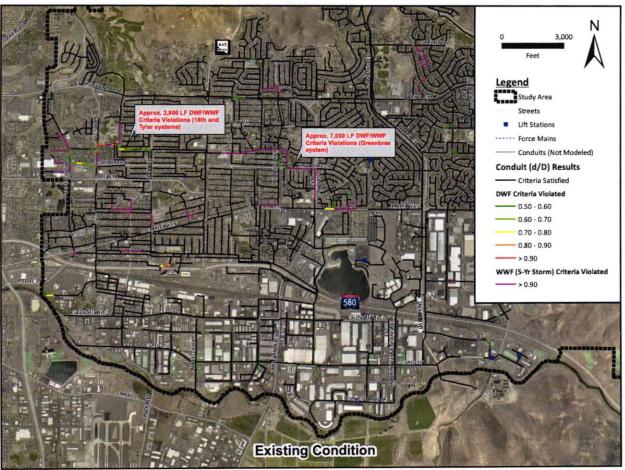


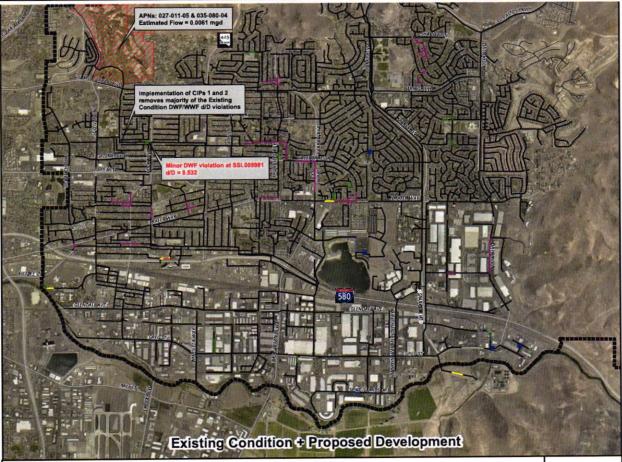
ATKINS

Sparks

Sewer Model Update
Wildcreek Development Project - Vicinity Map

Figure 1

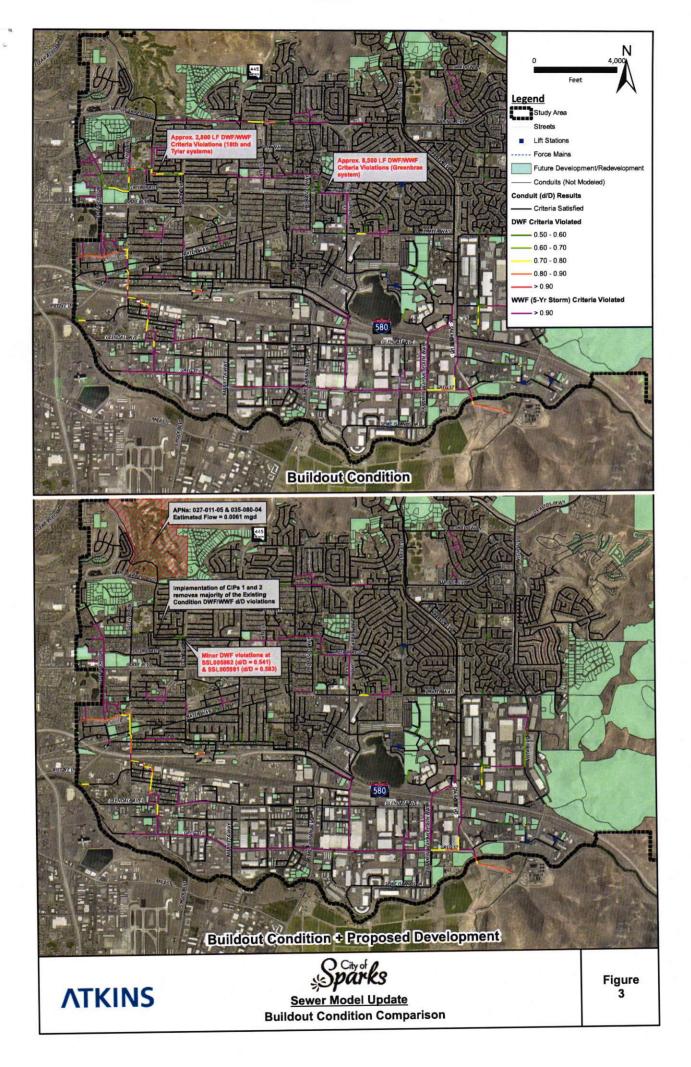


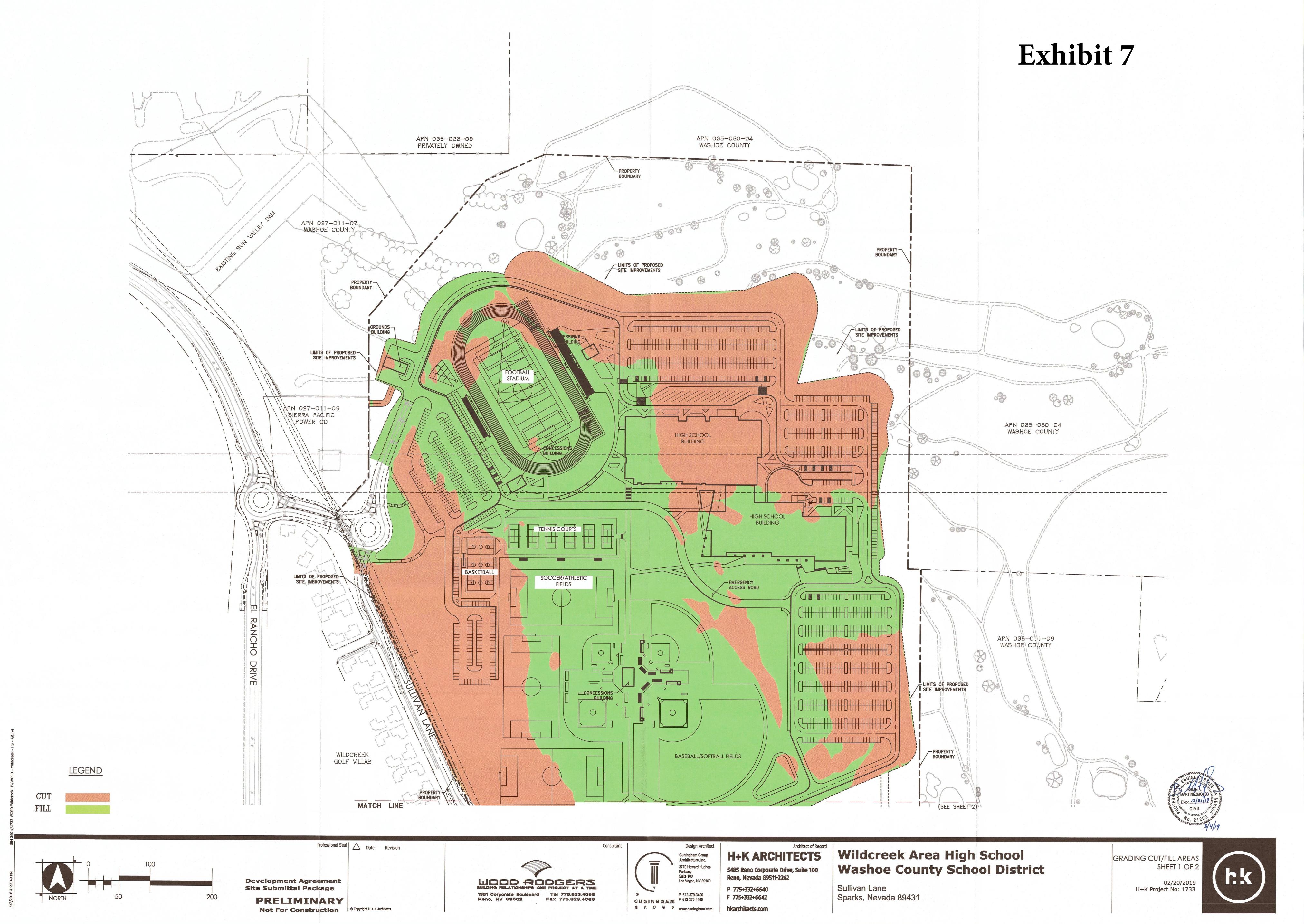


ATKINS

Sewer Model Update
Existing Condition Comparison

Figure 2







4/2/2018 4:22:49 PM

BIM 360://1733 WCSD Wildcreek HS/WCSD - Wildcreek - HS - AR. IV

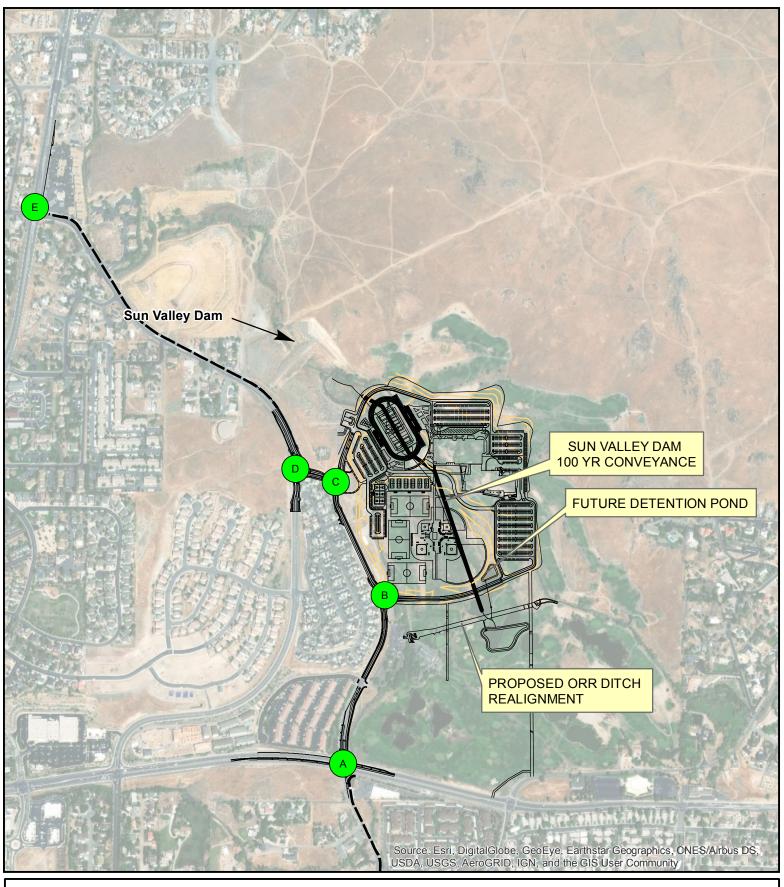




Exhibit 8

