Miller, Forrest

From: Miller, Forrest
Sent: Tuesday, December 13, 2016 12:45 PM
To: Miller, Forrest
Subject: FW: NESNR Public Hearing Follow-up
Attachments: Audubon Elementary School TMP Monitoring October 2016.pdf; Horace Mann TMP Monitoring Study October 2016.pdf; Redmond Elementary School TMP Monitoring November 2016 12-13-16.pdf

Importance: High

From: Chris Forster [mailto:forster@tenw.com]
Sent: Tuesday, December 13, 2016 10:59 AM
To: Miller, Forrest <FMiller@lwsd.org>; Buck, Brian <bbuck@lwsd.org>; Denise Stiffarm <Denise.Stiffarm@pacificalawgroup.com>
Cc: Chandler, Dan <c-dchandler@lwsd.org>; Sahl, Andrew <c-asahl@lwsd.org>; Sprague, Patrick <c-psprague@lwsd.org>; Amy Wasserman <amy@tenw.com>; Jeff Haynie <haynie@tenw.com>
Subject: RE: NESNR Public Hearing Follow-up
Importance: High

Forrest,
Attached are the 3 most recent (Fall 2016) TMP monitoring reports for Audubon, Horace Mann, and Redmond Elementary, which have all been previously transmitted to the City. Below is a Onedrive link to the video data collected at each school, followed by a description of each video location. A map showing the video locations is also available via the Onedrive link. The specific video location that was used to verify the "duration of vehicle queue spillover" at each school is shown in red.
As the City showed in their presentation and as shown in the attached monitoring report, Audubon continues to exceed the Maximum Acceptable Level (MAL) defined in the TMP. However, the Fall 2016 monitoring reports show that both Horace Mann and Redmond Elementary are currently meeting the MAL requirements.

Audubon Elementary Fall 2016 TMP Monitoring
The memo that was submitted to the City that summarizes the Fall 2016 TMP monitoring requirements is attached. The video data (and corresponding location map) for Audubon Elementary can be found here:
https://1drv.ms/f/s!AntUysNOkwU4m8s_TCrxCLIpWn3wEA

Video data was collected at 7 locations on Tuesday, October 25, 2016 and Thursday, October 27, 2016 from 8:00 to 9:00 a.m. and 2:30 to 3:30 p.m. School bell schedule: Start = 8:30 a.m., Dismissal = 3:00 p.m. The 7 locations are described below and illustrated on the map found in the below OneDrive link.

1. View looking north on 180th Ave NE from southwest corner of 180th Ave NE/School Main Driveway that shows School Main Driveway (this video was used to verify "duration of vehicle queue spillover").
2. View looking east on NE 30th Street from the west side of 180th Ave NE that shows NE 30th Street east of 180th Ave NE (this video was used to count off-site drop-off/pick-ups).
3. View looking east on NE 29th Street from the north side of NE 29th Street that shows NE 29th Street from 178th Ave NE to 180th Ave NE (this video was used to count off-site drop-off/pick-ups).
4. View looking north on 177th Ave NE from SE corner of 177th Ave NE/NE 31st Place that shows 177th Ave NE from NE 31st Place to NE 33rd Street (this video was used to count off-site drop-off/pick-ups).
5. View looking south on 177th Ave NE from NE corner of 177th Ave NE/NE 33rd Street that shows 177th Ave NE from NE 33rd Street to NE 31st Place (this video was used to count off-site drop-off/pick-ups).

6. View looking east on NE 33rd Place from west side of 180th Ave NE that shows NE 33rd Place east of 180th Ave NE (this video was used to count off-site drop-off/pick-ups).
7. View looking north on 180th Ave NE from SE corner of 180th Ave NE/Bus&Staff School Driveway that shows 180th Ave NE north of Bus&Staff School Driveway (additional video to show extent of southbound queuing on 180th Ave NE).

Horace Mann Elementary Fall 2016 TMP Monitoring

The memo that was submitted to the City that summarizes the Fall 2016 TMP monitoring requirements is attached. The video data (and corresponding location map) for Horace Mann Elementary can be found here: https://1drv.ms/f/s!AntUysNOkwU4m8svlAn-eu5Zc6gfLg

Video data was collected at 2 locations on Tuesday, October 25, 2016 and Thursday, October 27, 2016 from 8:00 to 9:00 a.m. and 2:30 to 3:30 p.m. School bell schedule: Start = 8:30 a.m., Dismissal = 3:00 p.m. The 2 locations are described below and illustrated on the map found in the below OneDrive link.

1. View looking west on NE 104th Street from southeast corner of NE 104th Street/School Enter-Only Driveway that shows Enter-Only driveway and eastbound on-street queue storage lane (this video used to verify "duration of vehicle queue spillover").
2. View looking east on NE 104th Street from the south side of NE 104th Street west of 168th Ave NE that shows the eastbound on-street queue storage lane (shows the extent of eastbound queuing on NE 104th St in the on-street queuing lane).

Redmond Elementary Fall 2016 TMP Monitoring

The memo that was submitted to the City that summarizes the Fall 2016 TMP monitoring requirements is attached. The video data (and corresponding location map) for Redmond Elementary can be found here: https://1drv.ms/f/s!AntUysNOkwU4m8t5HvWEgmew3nPRpQ

Video data was collected at 7 locations on Tuesday, November 15, 2016 and Thursday, November 17, 2016 from 8:30 to 9:30 a.m. and 3 to 4 p.m. School bell schedule: Start = 9:00 a.m., Dismissal = 3:30 p.m. The 7 locations are described below and illustrated on the map found in the below OneDrive link.

A) View looking west on NE 83rd Street from east side of 167th Ave NE that shows NE 83rd Street between 166th Ave NE and 167th Ave NE (this video was used to count off-site drop-off/pick-ups).
B) View looking west on NE 80th Street from NE corner of Bus Exit Only Driveway that shows NE 80th Street between Old Schoolhouse driveway and Bus Exit Only Driveway (this video was used to count off-site drop-off/pick-ups).
C) View looking west on NE 80th Street from NE corner of Bus Enter Only Driveway that shows NE 80th Street between Bus Exit Only Driveway and Bus Enter Only Driveway/168th Ave NE (this video was used to count off-site drop-off/pick-ups).
D) View looking west on NE 80th Street from NW corner of NE 80th Street/169th Ave NE that shows NE 80th Street between Bus Enter Only Driveway/168th Ave NE and 169th Ave NE (this video was used to count off-site drop-off/pick-ups).
E) View looking north on 169th Ave NE from SE corner of NE 80th Street/169th Ave NE that shows 169th Ave NE between NE 80th Street and South School Driveway (this video was used to count off-site drop-off/pick-ups).
F) View looking south on 169th Ave NE from NE corner of NE 82nd Street/169th Ave NE that shows 169th Ave NE between NE 82nd Street/North School Driveway and South School Driveway (this video used to verify "duration of vehicle queue spillover").
G) View looking east on NE 80th Street from NW corner of NE 80th Street/169th Ave NE that shows NE 80th Street between 169th Ave NE and 170th Ave NE (this video was used to count off-site drop-off/pick-ups).

Chris Forster, P.E. | Sr. Project Manager

TENW 11400 SE 8th Street, Suite 200, Bellevue, WA 98004

TECHNICAL MEMORANDUM

DATE: December 2, 2016

TO: Kim Keeling
City of Redmond

FROM: Amy Wasserman
TENW

SUBJECT: Summary of October 2016 TMP Monitoring Study
Audubon Elementary School
TENW Project No. 5264

This memorandum summarizes the results of the October 2016 Transportation Management Program (TMP) monitoring study for Audubon Elementary School. The monitoring study followed the requirements as defined in Section IV Program Review of the approved Audubon Elementary School TMP. A copy of the approved TMP is included in Attachment A. The TMP monitoring requirements include quantifying the duration of queue spillover onto 180th Ave NE and a summary of any off-site pick-up and drop-off activity on adjacent streets and reporting the results to the City. The TMP monitoring requirements also include the electronic transmittal of any corresponding video data to the City of Redmond.

Drop-Off/Pick-Up Queue Spillover onto 180th Ave NE

TENW collected video data on 180th Ave NE adjacent to Audubon Elementary School to determine the "duration of vehicle queue spillover" onto 180th Ave NE. The "duration of vehicle queue spillover" is defined as the continuous number of minutes that a vehicle queue extends from the main site entrance driveway and causes a blockage of vehicular through traffic on 180th Ave NE in the northbound and southbound directions. Vehicles waiting to enter the driveway due to yielding to through traffic or pedestrians do not constitute "queue spillover."

The video data was collected on Tuesday, October 25, 2016 and Thursday, October 27, 2016 ("normal" school days) during the peak AM drop-off period (8:00 to 8:45 a.m.) and the peak Afternoon pick-up period (2:40 to 3:20 p.m.). The video data will be transmitted to the City of Redmond separately.

Table 1 summarizes the October 2016 duration of queue spillover (in minutes and seconds) onto 180th Ave NE during the AM and Afternoon peak periods. A more detailed summary of the queue spillover is included in Attachment B.

Table 1
October 2016 Duration of Queue Spillover onto 180th Ave NE

	Duration of Queue Spillover		
Peak Period	Tuesday 10/25/16	Thursday 10/27/16	Two-Day Average
AM Drop-Off (8:00 to 8:45 a.m.)	11 min 46 sec	2 min 30 sec	7 min 8 sec
Afternoon Pick-Up (2:40 to 3:20 p.m.)	14 min 5 sec	14 min 43 sec	14 min 24 sec

Based on TENW's review of the October 2016 video data collected on 180th Ave NE, the 2-day average duration of queue spillover onto 180th Ave NE was 7 minutes 8 seconds in the AM peak and 14 minutes 24 seconds in the Afternoon peak.

The Maximum Acceptable Level (MAL) duration of queue spillover (in minutes) for both the AM and Afternoon peak periods was defined in the TMP dated 2/23/16 (see Attachment A) and was based on observations conducted in October 2015. A summary of the current (October 2016) duration of queue spillover compared to the October 2015, February 2016, and April 2016 observed queue spillover and the MAL duration of queue spillover (as defined in the TMP) is included in Table 2.

Table 2
Summary of Queue Spillover Onto 180th Ave NE

	2-Day Average Duration of Queue Spillover (min:sec)				
Peak Period	Maximum Acceptable Level (MAL) per TMP	October 2015	February 2016	April 2016	October 2016
AM Peak	3:30	7:10	2:01	4:38	7:08
Afternoon Peak	3:00	5:15	14:14	5:17	14:24
MAL Requirements Met? [1]		N/A	NO	NO	NO

1. MAL requirements are met if the duration of queue spillover is less than or equal to the MAL for both the AM and Afternoon peak periods. The October 2015 observations were conducted prior to establishment of the MAL so they do not apply towards the MAL requirements as defined in the TMP.

As shown in Table 2, the October 2016 duration of queue spillover onto 180th Ave NE is greater than the MAL for both the AM and Afternoon peak periods.

Off-Site Drop-off and Pick-Up Activity

Video observations were conducted at Audubon Elementary School over a two-day study period (Tuesday, October 25, 2016 and Thursday, October 27, 2016) during the AM peak drop-off period (8:00 to 8:45 AM) and during the Afternoon peak pick-up period (2:40 to 3:20 PM). The two-day study included counts of all school-related drop-offs and pick-ups on the following streets adjacent to the school:

- NE 30th Street east of 180th Ave NE to 18134 NE 30th Street
- NE 29th Street between 178th Ave NE and 180th Ave NE
- 177th Ave NE between NE 31st Pl and NE 33rd St
- NE 33rd St between 180th Ave NE and 181st Pl NE

A summary of the drop-off and pick-up activity on the streets defined above is included in Table 3. The detailed drop-off and pick-up data is included in Attachment C.

Table 3
October 2016 Summary of Off-Site Drop-Offs and Pick-Ups

	2-Day Average Off-Site Vehicle Trips					
	AM Peak Drop-Off Period (8:00 to 8:45 AM)			Afternoon Peak Pick-Up Period (2:40 to 3:20 PM)		
Off-Site Location	In	Out	Total	In	Out	Total
NE 30th St (180th Ave NE to 18134 NE 30th St)	20	19	39	24	24	48
NE 29th St (178th Ave NE to 180th Ave NE)	7	6	13	8	8	16
177th Ave NE (NE 31st Pl to NE 33rd St)	16	17	33	11	12	23
NE 33rd St (180th Ave NE to 181st Pl NE)	1	1	2	3	3	6
TOTAL	**44**	**43**	**87**	**46**	**47**	**93**

As shown in Table 3, a 2-day average of 44 vehicles utilized on-street parking on the off-site streets for student drop-off during the AM peak period and a 2-day average of 46 vehicles utilized on-street parking on the off-site streets for student pick-up during the Afternoon peak period.

Conclusion

The October 2016 monitoring study showed that the two-day average duration of queue spillover onto 180th Ave NE was greater than the Maximum Acceptable Level (MAL) as defined in the TMP for both the AM and Afternoon Peak periods.

The TMP Monitoring requirements state that MAL must be met for three consecutive monthly monitorings, so the monitoring will be conducted again at Audubon Elementary in February 2017.

If you have any questions, please feel free to contact me at (425) 250-0579 or amy@tenw.com.

cc: Brian Buck, Lake Washington School District
Michael Romero, Lake Washington School District
Jeff Haynie, P.E., Principal – TENW

Attachments

ATTACHMENT A

Audubon Elementary Approved TMP (2/23/16)

Lake Washington
School District

TRAFFIC MANAGEMENT PROGRAM
AUDUBON ELEMENTARY SCHOOL

Audubon Elementary School is located at 3045 180th Ave NE in Redmond. The school currently accommodates 565 students in grades K-5, with 42 staff and teachers supporting the instructional and facility activities. The school operates 180 days of regular instruction, with 20% of those being early dismissal days which results in different pick-up times. The class day begins at 8:30 AM and ends at 3:00 PM. By contract, full-time faculty/staff arrive by 8:00 AM and depart no earlier than 3:31 PM. The school is currently in operation. The Audubon Elementary Portable project would include the addition of a portable to the site with a capacity of up to 23 students and 1 staff.

I. Program Objective

This Traffic Management Plan is intended to manage the on-site traffic at Audubon Elementary School at and around school start and dismissal times, and includes elements to eliminate impacts to adjoining neighborhoods and streets.

II. Program Goal

This Traffic Management Plan aims to manage the on-site traffic operations during peak drop-off and pick-up times (8:00-8:45 AM and 2:40-3:20 PM), and minimize the duration of vehicle queue spillover onto 180th Ave NE. The "duration of vehicle queue spillover" is defined as the continuous number of minutes that a vehicle queue extends from the main site entrance driveway and causes a blockage of vehicular through traffic on 180th Ave NE in the northbound or southbound directions.

TARGETS	**Duration of Queue Spillover (AM peak)**	**Duration of Queue Spillover (PM peak)**
Current	7 min; 10 seconds	5 min; 15 seconds
Maximum Acceptable Level (MAL)*	3.5 minutes	3 minutes
Goal	0 minutes	0 minutes

*LWSD and the City of Redmond established the MAL after the first monitoring period in October 2015.

III. Program Elements

A. On-Site Elements

- Assign up to 2 paid staff to manage on-site operations and move vehicles forward
- Training (flagger certification class and on-site training/instruction sheets)
- 64 parking stalls are available for staff (29) and visitors (35), including 3 ADA parking stalls. Parking stalls are not delineated as visitor or staff. 85% of the staff are on site concurrently, and 95% of the staff are assumed to drive a single-occupancy vehicle.
- 3 bike racks are available to accommodate 33 bicycles (When the number of bicycles exceeds the current capacity, the district will install additional bike racks)
- Temporary and permanent directional signage (sandwich boards, cones, etc.)
- Maintain separate bus loop/staff parking access and prohibit parent drop-offs or pick-ups in the bus loop.

B. Off-Site Elements

- Assign 4 staff to be located off-site to manage the pedestrian crossings adjacent to the school:
  - 1 at the crosswalk at the intersection of 180h Ave. NE and NE 28th St. – crossing E/W
  - 1 at the crosswalks at the intersection of 180th Ave. NE and 29th St. – crossing N/S
  - 1 at the crosswalks at the intersection of 180th Ave. NE and 30th St. – crossing E/W
  - 1 at the crosswalk at the intersection of 180th Ave. NE and NE 33rd St. – crossing E/W
- Message to parents through monthly newsletter to parents, PTSA presentations, etc. Topics include:
  - On-site traffic flow and drop-off/pick-up procedures.
  - Safe-walk routes
  - Encouraging parents to have children walk to school
- Provide Transportation Information Center for parents and students. The exact medium to use has not been determined (bulletin board or website). Comments and suggestions will be collected and shared with the City in our annual report (See section IV) or upon request

IV. Program Review

LWSD will conduct monitoring studies of the traffic operations at Audubon Elementary three times per year in the months of October, February and April. The studies shall be at the district's sole expense and conducted and summarized by a 3rd party vendor selected by the district with professional training in conducting such studies. Monitoring shall also include a summary of any off-site pick-up and drop-off activity in adjacent neighborhoods or on adjacent streets. Video data will be provided to the City of Redmond electronically. Streets to be monitored include NE 30th east of 180th Ave. NE to 18134; NE 29th St between178th Ave NE and 180th Ave. NE; on 177th Ave. NE between 31st Pl NE and NE 33rd St.; and on NE 33rd St. between 180th Ave NE and 181st Pl NE.

Monitoring will continue following the establishment of the MAL until 3 consecutive monthly monitoring results show the MAL has been met (after the MAL has been established in October 2015), upon which monitoring will be conducted annually in the spring. When 2 consecutive annual monitoring results show the MAL has been met, the LWSD and the City will meet to discuss future monitoring requirements.

An annual report on the TMP activities and progress towards meeting the TMP targets will be prepared and submitted to the City of Redmond Transportation Programs Administrator by July 31 of each year (or date agreed upon mutually by LWSD and the City).

V. Contingency Measures

Following the establishment of the MAL, in the event that 3 consecutive monthly TMP reports or 2 consecutive annual TMP reports show the MAL in Section II is not being met, LWSD will implement the following sequentially:

1. Develop alternative strategies to manage vehicles efficiently that are acceptable to

the City;
2. Construct physical improvements at the site to accommodate enough vehicles to meet the "Goal";
3. Leave the new portable unoccupied until such time that LWSD demonstrates, to the City's satisfaction, the ability to meet the MAL

VI. Staff Training

The Lake Washington School District will engage a qualified traffic safety training firm to train District staff in managing vehicular and pedestrian traffic. The training program will follow the outline below:

- Conduct an on-site classroom training session during the last half of August when staff returns to the school.
- Engage training staff to be on site one day per week each of the first three weeks of the school year to provide hands on assistance
- LWSD will monitor the effectiveness of on-site traffic management personnel and utilize training staff for additional training as needed.

VII. NE 30th PL and Adjacent Neighborhoods

The goal is for no student drop/pick-up at adjacent neighborhoods and streets. The efforts on NE 180th are intended to encourage parents to use the front of the school in lieu of dropping their children on NE 30th PL or at other adjacent neighborhoods.

VIII. Nature of Obligation

The property owner agrees to inform subsequent owners and/or lessees of all or part of the site covered by this Traffic Management Plan, that RZC Section 21.52.020 (or its successor) contains specific requirements pertaining to maintenance of a Traffic Management Plan. Owners and/or lessees should consult the Redmond Zoning Code and/or City of Redmond staff regarding current code requirements for Traffic Management Plan.

Lake Washington
School District

This Traffic Management Plan is approved by:

LAKE WASHINGTON SCHOOL DISTRICT

BY: _____

Signature | Date

Forrest Miller | Director of Support Services

Printed Name | Title

CITY OF REDMOND

BY: Kim Keeling | 2/23/16

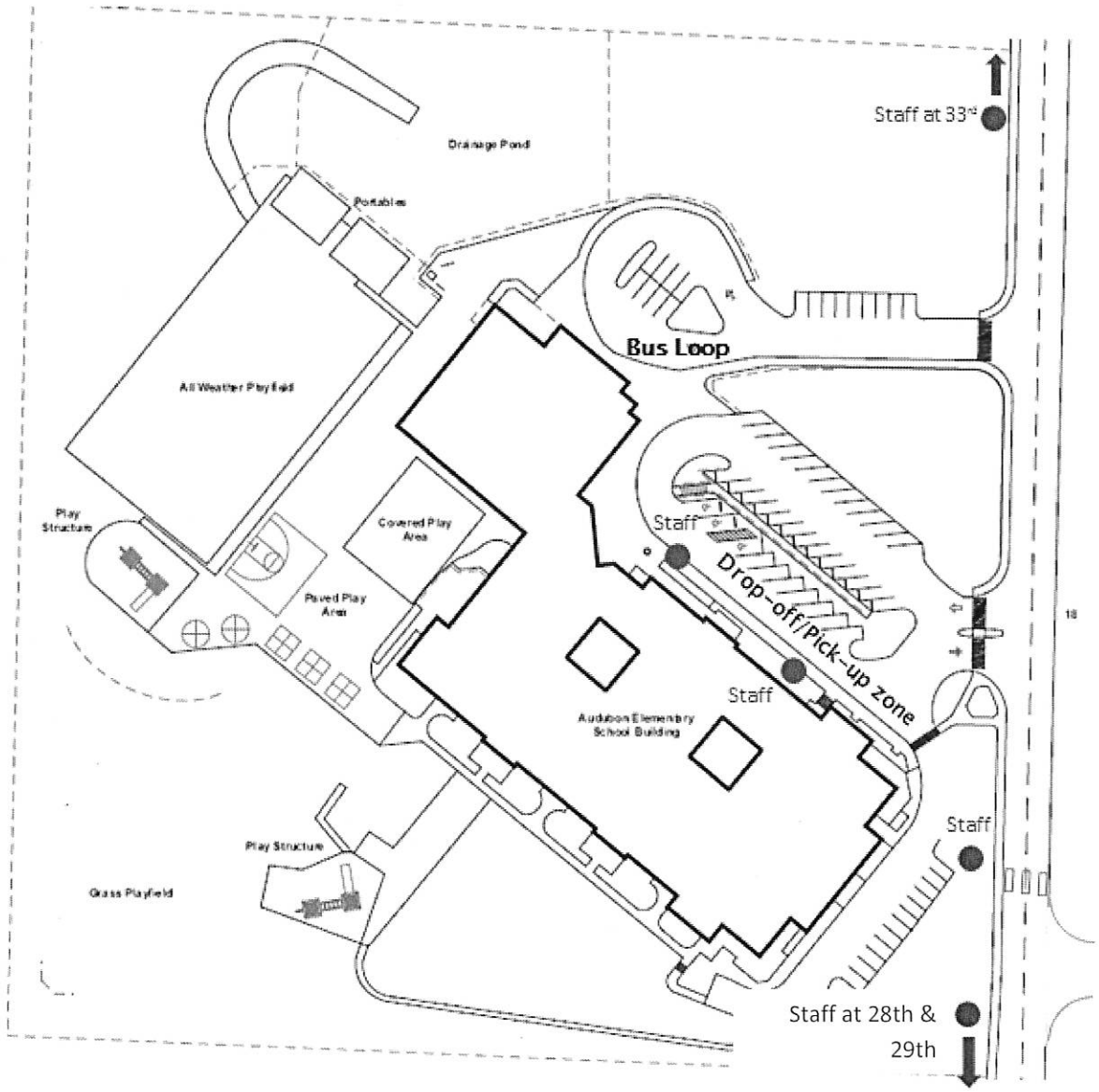
Signature | Date

Kim Keeling | Transportation Programs Administrator

Printed Name | Title

Lake Washington School District

Audubon Elementary School Parking & Vehicle Circulation Layout



Map needs to show the back path connection.

ATTACHMENT B

Duration of Queue Spillover

LWSD - Audubon Elementary
October 2016 TMP Monitoring Study

Duration of Queue Spillover onto 180th Ave NE

AM PEAK PERIOD (8:00 - 8:45 AM)

	Total Queue Spillover (min/sec)
Tuesday 10/25/16	11:46
Thursday 10/27/16	02:30
2-Day Average	**07:08**

AFTERNOON PEAK PERIOD (2:40 - 3:20 PM)

	Total Queue Spillover (min/sec)
Tuesday 10/25/16	14:05
Thursday 10/27/16	14:43
2-Day Average	**14:24**

LWSD - Audubon Elementary
October 2016 TMP Monitoring Study

Duration of Queue Spillover onto 180th Ave NE
TUESDAY 10/25/16

AM PEAK PERIOD (8:00 - 8:45 AM)

Queue Spillover (Blockage)		
Time Start	**Time End**	**Total Time (min/sec)**
8:14:58	8:16:00	01:02
8:16:20	8:25:30	09:10
8:26:00	8:26:50	00:50
8:27:00	8:27:30	00:30
8:28:34	8:28:48	00:14
	Total Time	**11:46**

AFTERNOON PEAK PERIOD (2:40 - 3:20 PM)

Queue Spillover (Blockage)		
Time Start	**Time End**	**Total Time (min/sec)**
2:50:00	2:50:28	00:28
2:52:40	3:05:00	12:20
3:05:25	3:06:42	01:17
	Total Time	**14:05**

LWSD - Audubon Elementary
October 2016 TMP Monitoring Study

Duration of Queue Spillover onto 180th Ave NE
THURSDAY 10/27/16

AM PEAK PERIOD (8:00 - 8:45 AM)

Queue Spillover (Blockage)		
Time Start	**Time End**	**Total Time (min/sec)**
8:14:00	8:14:14	00:14
8:15:05	8:16:05	01:00
8:16:26	8:17:20	00:54
8:23:23	8:23:45	00:22
Total Time		**02:30**

AFTERNOON PEAK PERIOD (2:40 - 3:20 PM)

Queue Spillover (Blockage)		
Time Start	**Time End**	**Total Time (min/sec)**
2:54:12	3:08:55	14:43
Total Time		**14:43**

ATTACHMENT C

Detailed Off-Site Drop-Off and Pick-Up Data

Audubon Elementary School
TMP Monitoring Study
TENW Project #5264

Summary of Off-Site Drop-Off and Pick-Up Activity - October 2016

AM Peak Period (8:00 a.m. to 8:45 a.m.)

	Off-Site Drop-Offs										
	A - NE 30th St (180th Ave NE to 18134)		B - NE 29th St (178th Ave NE to 180th Ave NE)		C - 177th Ave NE (NE 31st Pl to NE 33rd St)		D - NE 33rd St (180th Ave NE to 181st Pl NE)		**TOTAL Off-Site Drop-Offs**		
Day	In	Out	In	Out	In	Out	In	Out	**In**	**Out**	**Total**
Tuesday 10/25/16	20	19	6	5	12	13	2	1			
Thursday 10/27/16	19	18	8	7	19	20	0	0			
2-Day Average	20	19	7	6	16	17	1	1	**44**	**43**	**87**

Afternoon Peak Period (2:40 p.m. to 3:20 p.m.)

	Off-Site Pick-Ups										
	A - NE 30th St (180th Ave NE to 18134)		B - NE 29th St (178th Ave NE to 180th Ave NE)		C - 177th Ave NE (NE 31st Pl to NE 33rd St)		D - NE 33rd St (180th Ave NE to 181st Pl NE)		**TOTAL Off-Site Pick-Ups**		
Day	In	Out	In	Out	In	Out	In	Out	**In**	**Out**	**Total**
Tuesday 10/25/16	26	25	6	6	11	11	2	2			
Thursday 10/27/16	22	23	10	9	11	12	3	3			
2-Day Average	24	24	8	8	11	12	3	3	**46**	**47**	**93**

Audubon Elementary School
TMP Monitoring Study
TENW Project #5264

Tuesday, October 25, 2016

AM Peak Drop-Off Period

	A1 - NE 30th St (180th Ave NE to 181st Ave NE)		A2 - NE 30th St (181st Ave NE to 18134)		B - NE 29th St (178th Ave NE to 180th Ave NE)		C - 177th Ave NE (NE 31st Pl to NE 33rd St)		D - NE 33rd St (180th Ave NE to 181st Pl NE)		**TOTAL Off-Site Drop-Offs**		
Time period starting	In	Out	In	Out	In	Out	In	Out	In	Out	**In**	**Out**	**Total**
8:00 AM	0	0	0	0	0	0	3	2	0	0	**3**	**2**	**5**
8:15 AM	20	14	0	0	5	4	9	8	2	1	**36**	**27**	**63**
8:30 AM	0	5	0	0	1	1	0	3	0	0	**1**	**9**	**10**
45-minute total	20	19	0	0	6	5	12	13	2	1	**40**	**38**	**78**

Afternoon Peak Pick-Up Period

	A1 - NE 30th St (180th Ave NE to 181st Ave NE)		A2 - NE 30th St (181st Ave NE to 18134)		B - NE 29th St (178th Ave NE to 180th Ave NE)		C - 177th Ave NE (NE 31st Pl to NE 33rd St)		D - NE 33rd St (180th Ave NE to 181st Pl NE)		**TOTAL Off-Site Pick-Ups**		
Time period starting	In	Out	In	Out	In	Out	In	Out	In	Out	**In**	**Out**	**Total**
2:40 PM	1	0	0	0	2	0	5	0	0	0	**8**	**0**	**8**
2:50 PM	14	1	5	0	3	1	4	4	1	0	**27**	**6**	**33**
3:00 PM	3	6	3	4	1	3	2	3	1	0	**10**	**16**	**26**
3:10 PM	0	10	0	4	0	2	0	4	0	2	**0**	**22**	**22**
40-minute total	18	17	8	8	6	6	11	11	2	2	**45**	**44**	**89**

Audubon Elementary School
TMP Monitoring Study
TENW Project #5264

Thursday, October 27, 2016

AM Peak Drop-Off Period

	A1 - NE 30th St (180th Ave NE to 181st Ave NE)		A2 - NE 30th St (181st Ave NE to 18134)		B - NE 29th St (178th Ave NE to 180th Ave NE)		C - 177th Ave NE (NE 31st Pl to NE 33rd St)		D - NE 33rd St (180th Ave NE to 181st Pl NE)		**TOTAL Off-Site Drop-Offs**		
Time period starting	In	Out	In	Out	In	Out	In	Out	In	Out	**In**	**Out**	**Total**
8:00 AM	3	0	0	0	0	0	2	1	0	0	**5**	**1**	**6**
8:15 AM	16	13	0	0	8	3	17	9	0	0	**41**	**25**	**66**
8:30 AM	0	5	0	0	0	4	0	10	0	0	**0**	**19**	**19**
45-minute total	19	18	0	0	8	7	19	20	0	0	**46**	**45**	**91**

Afternoon Peak Pick-Up Period

	A1 - NE 30th St (180th Ave NE to 181st Ave NE)		A2 - NE 30th St (181st Ave NE to 18134)		B - NE 29th St (178th Ave NE to 180th Ave NE)		C - 177th Ave NE (NE 31st Pl to NE 33rd St)		D - NE 33rd St (180th Ave NE to 181st Pl NE)		**TOTAL Off-Site Pick-Ups**		
Time period starting	In	Out	In	Out	In	Out	In	Out	In	Out	**In**	**Out**	**Total**
2:40 PM	6	1	0	0	2	0	3	0	0	0	**11**	**1**	**12**
2:50 PM	10	2	4	0	5	0	4	0	3	0	**26**	**2**	**28**
3:00 PM	0	9	1	3	1	5	3	7	0	2	**5**	**26**	**31**
3:10 PM	1	6		2	2	4	1	5	0	1	**4**	**18**	**22**
40-minute total	17	18	5	5	10	9	11	12	3	3	**46**	**47**	**93**

TECHNICAL MEMORANDUM

DATE: November 17, 2016

TO: Kim Keeling
City of Redmond

FROM: Amy Wasserman
TENW

SUBJECT: Summary of Annual (October 2016) TMP Monitoring Study
Horace Mann Elementary School
TENW Project No. 5220

This memorandum summarizes the results of the annual (October 2016) Transportation Management Program (TMP) monitoring study for Horace Mann Elementary School. The annual monitoring study followed the requirements as defined in Section IV Program Review of the approved Horace Mann Elementary School TMP dated 8/19/15. A copy of the approved TMP is included in Attachment A. The TMP monitoring requirements include quantifying the duration of queue spillover onto NE 104th Street and reporting the results to the City. The TMP monitoring requirements also include the electronic transmittal of any corresponding video data to the City of Redmond.

Drop-Off/Pick-Up Queue Spillover onto NE 104th Street

TENW collected video data on NE 104th Street at the Horace Mann main site entrance driveway to determine the "duration of vehicle queue spillover" onto NE 104th Street. The "duration of vehicle queue spillover" is defined as the continuous number of minutes that a vehicle queue extends from the main site entrance driveway and causes a blockage of vehicular through traffic on NE 104th Street in the eastbound or westbound directions. Vehicles waiting to enter the driveway due to yielding to through traffic or pedestrians do not constitute "queue spillover."

The video data was collected on Tuesday, October 25, 2016 and Thursday, October 27, 2016 ("normal" school days) during the peak AM drop-off period (8:00 to 8:45 a.m.) and the peak afternoon pick-up period (2:40 to 3:20 p.m.). The video data will be transmitted to the City of Redmond separately.

Table 1 summarizes the October 2016 duration of queue spillover (in minutes) onto NE 104th Street during the AM and Afternoon peak periods. A more detailed summary of the queue spillover is included in Attachment B.

Table 1
October 2016 Duration of Queue Spillover onto NE 104th St

	Duration of Queue Spillover		
Peak Period	Tuesday 10/25/16	Thursday 10/27/16	Two-Day Average
AM Drop-Off (8:00 to 8:45 a.m.)	4 min 54 sec	1 min 15 sec	3 min 5 sec
Afternoon Pick-Up (2:40 to 3:20 p.m.)	0 min 0 sec	0 min 34 sec	0 min 17 sec

As shown in Table 1, the 2-day average duration of queue spillover on NE 104th Street was 3 minutes and 5 seconds in the AM peak and 17 seconds in the Afternoon peak. All of the queue spillover during the AM peak period was due to westbound vehicles waiting to enter the site from NE 104th Street.

The TMP defined a Maximum Acceptable Level (MAL) duration of queue spillover (in minutes) for both the AM and Afternoon peak periods. A summary of the current (October 2016) duration of queue spillover compared to the MAL duration of queue spillover (as defined in the TMP) is included in Table 2.

Table 2
Summary of Queue Spillover Onto NE 104th Street

	2-Day Average Duration of Queue Spillover (min:sec)	
Peak Period	Maximum Acceptable Level (MAL) per TMP	October 2016
AM Peak	4:00	3:05
Afternoon Peak	6:30	0:17
MAL Requirements Met? [1]		YES

1. MAL requirements are met if the duration of queue spillover is less than or equal to the MAL for both the AM and Afternoon peak periods.

As shown in Table 2, the October 2016 duration of queue spillover onto NE 104th Street is less than the MAL for both the AM peak and Afternoon peak periods.

Conclusion and Next Steps

The first annual monitoring study (October 2016) showed that the two-day average duration of queue spillover onto NE 104th Street was less than the Maximum Acceptable Level as defined in the TMP for both the AM Peak and Afternoon Peak periods. Per the TMP requirements, the second annual monitoring study will be conducted in October 2017.

If you have any questions, please feel free to contact me at (425) 466-7072 or amy@tenw.com.

cc: Brian Buck, Lake Washington School District
Michael Romero, Lake Washington School District
Jeff Haynie, P.E., Principal - TENW

Attachments

ATTACHMENT A

Horace Mann TMP (August 19, 2015)

Lake Washington
School District

TRANSPORTATION MANAGEMENT PROGRAM
HORACE MANN ELEMENTARY

HME PRELIMINARY DRAFT TMP ELEMENTS

Mann Elementary School accommodates 470 students in grades K-5, with 41 staff and teachers supporting the instructional and facility activities. The school operates 180 days of regular instruction, with 20% of those being early dismissal days which results in different drop off times. The class day begins at 8:30AM and ends at 3:00PM. By contract, full-time faculty/staff arrive by 8:00 AM and depart no earlier than 3:31 PM. The school is currently in operation.

I. Program Objective

This Transportation Management Program (TMP) is intended to mitigate traffic at Horace Mann Elementary School at and around school start and dismissal times, and includes elements to minimize traffic backups onto NE 104th Street during peak drop-off and pick-up times, and impacts to adjoining neighborhoods and streets.

II. Program Goal

This Traffic Management Plan aims to manage the on-site traffic operations during peak drop-off and pick-up times and minimize the duration of vehicle queue spillover onto NE 104th Street. The "duration of vehicle queue spillover" is defined as the continuous number of minutes that a vehicle queue extends from the main site entrance driveway and causes a blockage of vehicular through traffic on NE 104th Street in the eastbound or westbound directions. Vehicles waiting to enter the driveway due to yielding to through traffic or pedestrians do not constitute "queue spillover". The duration of vehicle queue spillover will be measured during the peak AM drop-off (8:00 AM – 8:45 AM), and afternoon pick-up (2:40 PM – 3:20 PM) periods and averaged over a 2-day (Tuesday and Thursday) weekday period on "normal" school days (i.e., days without any special events that alter regular start/stop times). Specific goals to reduce queuing are as follows. LWSD believes that addressing traffic on NE 104th St. will encourage drivers to use this area in lieu of alternate locations in neighborhoods.

TARGETS	Duration of Queue Spillover (AM peak)	Duration of Queue Spillover (PM Peak)
Current	8 minutes	13 minutes
Maximum Acceptable Level (MAL)	4 minutes	6.5 minutes
Goal	0 minutes	0 minutes

III. Program Elements

A. On-SiteElements

- Assign up to 4 paid staff to manage and move vehicles forward
- Training (flagger certification class and on-site training/instruction sheets)
- 63 parking stalls, 35 in the area signed for staff parking, and 28 in the loop in front of the building for visitors. There are two stalls marked for vehicles with ADA plates
- 2 bike racks with a capacity of 22 bicycles When the number of bicycists is such

that the current bike rack capacity is insufficient, the district will install additional bike racks.

- Temporary and permanent directional signage (sandwich boards, cones, etc.), See map for locations.
- Off duty police will be assigned during the 1st week of school to encourage or reinforce good habits of dropping off students. A frame signs will be utilized and enhanced with flashers to attract attention.

B. Off-SiteElements

- Use current on-street parking on NE 104th as eastbound moving queue lane, as appropriate, adjacent to the storm pond. The use of NE 104th for queuing is a pilot and will be reassessed, along with the program targets, at the end of the 2015/16 school year.
- Manage westbound left turn from NE 104th through on-site circulation
- Message to parents through monthly newsletter to parents, PTSA presentations, etc. Topics include:
  - Off-site drop-off/pick-up
  - On-site traffic flow and management
  - School Pool
  - Walk routes
- Encourage parents to have children walk to school
- Add Transportation Information Center for parents and students. The exact medium to use has not been determined (bulleting board or website). Comments and suggestions will be collected and shared with the City in our annual report (See section IV) or upon request.

IV. Program Review

LWSD will conduct monitoring studies of the duration of queue spillover onto NE 104th three times per year in the months of October, February, April. Monitoring studies shall be at district's sole expense at the entrance driveway to the school sufficient to accurately quantify the duration of queue spillover onto NE 104th. The study will be conducted and summarized by a 3rd party vendor selected by the district with professional training in conducting such studies. Video data will be provided to the City of Redmond electronically.

Monitoring will continue until 3 consecutive monthly monitoring results (from the periods noted above) show that the MAL has been met, upon which monitoring will be conducted annually in the spring. When 2 consecutive annual monitoring results show the MAL has been met, the LWSD and the City will meet to discuss future monitoring requirements.

An annual report on the TMP activities and progress towards meeting the TMP goals will be prepared and submitted to the City of Redmond Transportation Programs Administrator by July 31 of each year (or date agreed upon mutually by LWSD and the City).

V. Contingecy Measures

In the event that 3 consecutive monthly TMP reports or 2 consecutive annual TMP reports show the MAL in Section II is not being met, LWSD will implement the following sequentially:

1. Develop on alternative strategies to manage vehicles efficiently that are acceptable to the City;
2. Start the design and implementation for physical improvements at the site to accommodate enough vehicles to meet the MAL;
3. Leave portables unoccupied until such time that LWSD demonstrates, to the City's satisfaction, the ability to meet the MAL

VI. Staff Training

The Lake Washington School District will engage the Evergreen Safety Council (ESC) to train District staff in managing vehicular and pedestrian traffic on the Mann Elementary School site. The training program will follow the outline below:

1. Conduct an on-site classroom training session during the last half of August when staff returns to the school. LWSD is currently coordinating with ESC on scheduling and specific site conditions to optimize the benefit of the training.
2. Engage ESC staff to be on-site one day each of the first three weeks of school to provide hands-on assistance to the newly trained staff.
3. LWSD will monitor the effectiveness of on-site traffic management personnel and utilize ESC for additional training as needed.

VII. NE 101st St. Cul-de-sac

The goal is for no student drop/pick-up at or near this cul-de-sac. The efforts on NE 104th are intended to encourage parents to use the front of the school in lieu of dropping their children on NE 101st. Off duty police or a school district representative (non-volunteer) will be assigned during the first week of the school year to discourage inappropriate drop off on NE 101st. The school will provide regular and active messaging to parents via newsletters, brochures, mailers, and/or email notifications in newsletters (see Section III.B) during the school year to discourage student pick-up/drop-off on NE 101st St and the adjacent areas, and to encourage the use of the front of the school or alternate City-approved locations. Messaging will also include posting flyers at the gates to encourage walking and discourage the use of vehicles.

VIII. Nature of Obligation

The property owner agrees to inform subsequent owners and/or lessees of all or part of the site covered by this TMP, that RZC Section 21.52.020 (or its successor) contains specific requirements pertaining to maintenance of a TMP. Owners and/or lessees should consult the Redmond Zoning Code and/or City of Redmond staff regarding current code requirements for TMP.

Horace Mann Elementary School Transportation Management Program
August 19, 2015

This Transportation Management Program is approved by

LAKE WASHINGTON SCHOOL DISTRICT

By: _____ 8/27/15
Signature Date

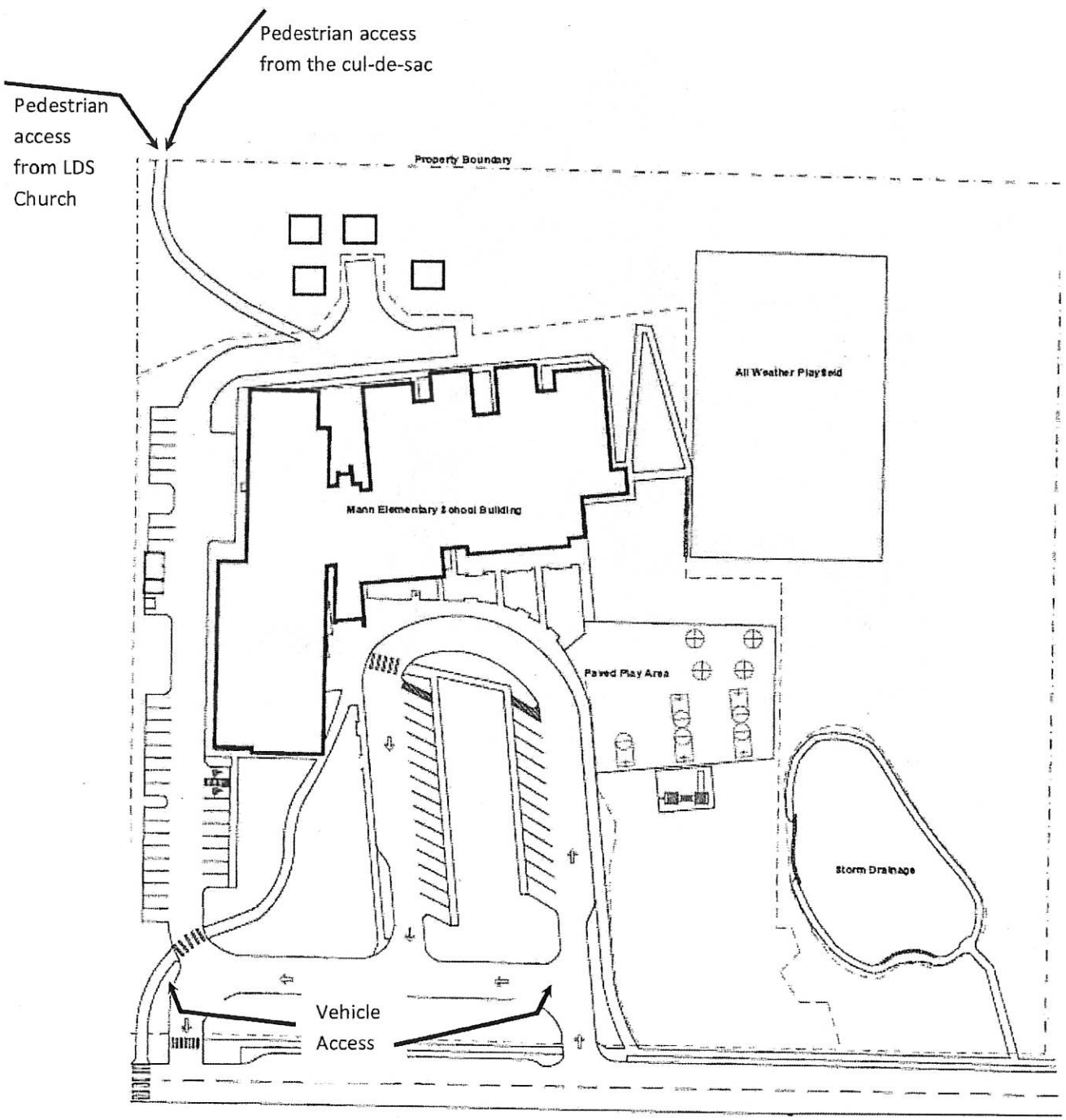
FORREST MILLER DIRECTOR of SUPPORT SERVICES
Printed Name Title

CITY OF REDMOND
By: _____ 8/27/15
Signature Date

Kim Keeling Transportation Programs Administrator
Printed Name Title

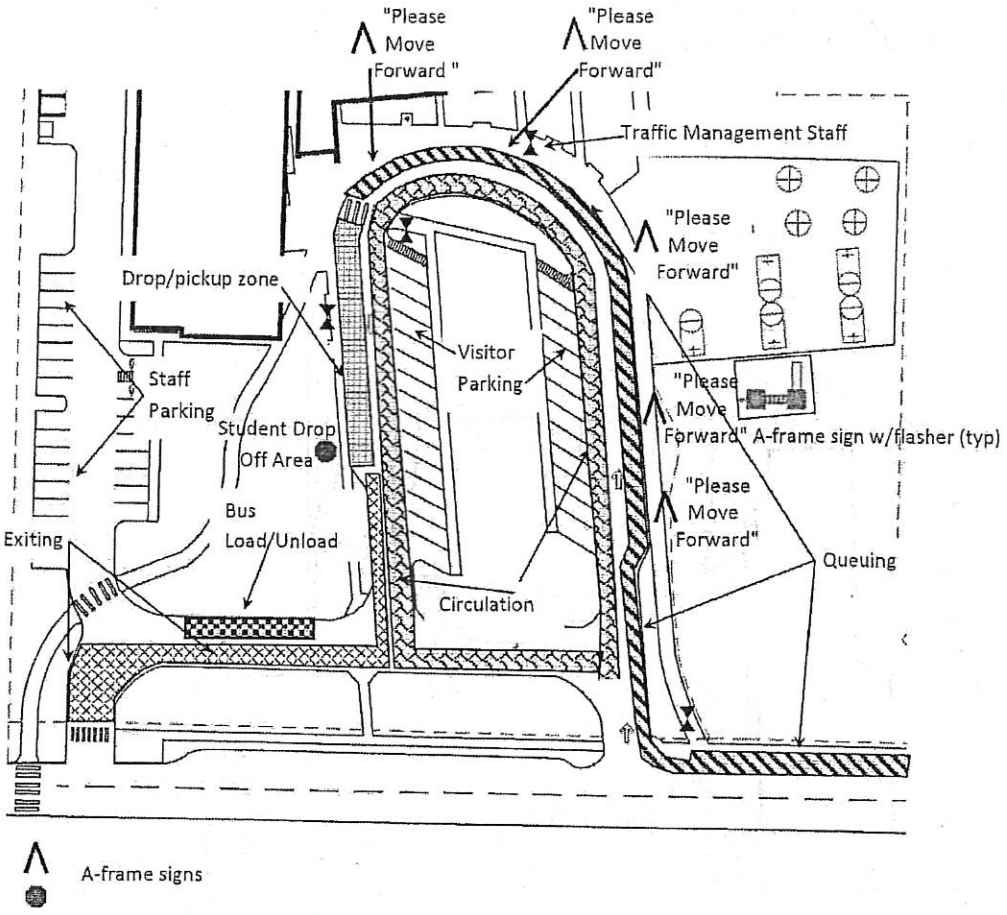
Horace Mann Elementary School Transportation Management Program
August 19, 2015

Map of access points



Horace Mann Elementary School Transportation Management Program
August 19, 2015

Map of on-site signage



ATTACHMENT B

October 2016 Duration of Queue Spillover

LWSD - Horace Mann
October 2016 TMP Monitoring Study

Duration of Queue Spillover onto NE 104th Street

OCTOBER 2016

AM PEAK PERIOD (8:00 - 8:45 AM)

	Total Queue Spillover (min/sec)
Tuesday 10/25/16	04:54
Thursday 10/27/16	01:15
2-Day Average	**03:05**

AFTERNOON PEAK PERIOD (2:40 - 3:20 PM)

	Total Queue Spillover (min/sec)
Tuesday 10/25/16	00:00
Thursday 10/27/16	00:34
2-Day Average	**00:17**

LWSD - Horace Mann
October 2016 TMP Monitoring Study

Duration of Queue Spillover onto NE 104th Street
TUESDAY 10/25/16

AM PEAK PERIOD (8:00 - 8:45 AM)

Queue Spillover (Blockage)		
Time Start	**Time End**	**Total Time (min/sec)**
8:17:47	8:18:16	00:29
8:20:22	8:20:59	00:37
8:20:59	8:21:15	00:16
8:22:00	8:22:37	00:37
8:23:13	8:23:58	00:45
8:24:33	8:25:02	00:29
8:25:48	8:26:22	00:34
8:26:33	8:26:51	00:18
8:27:27	8:27:53	00:26
8:28:14	8:28:37	00:23
	Total Time	**04:54**

AFTERNOON PEAK PERIOD (2:40 - 3:20 PM)

Queue Spillover (Blockage)		
Time Start	**Time End**	**Total Time (min/sec)**
		00:00
	Total Time	**00:00**

LWSD - Horace Mann
October 2016 TMP Monitoring Study

Duration of Queue Spillover onto NE 104th Street
THURSDAY 10/27/16

AM PEAK PERIOD (8:00 - 8:45 AM)

Queue Spillover (Blockage)		
Time Start	**Time End**	**Total Time (min/sec)**
8:21:29	8:21:52	00:23
8:22:34	8:23:03	00:29
8:24:00	8:24:05	00:05
8:24:58	8:25:16	00:18
	Total Time	**01:15**

AFTERNOON PEAK PERIOD (2:40 - 3:20 PM)

Queue Spillover (Blockage)		
Time Start	**Time End**	**Total Time (min/sec)**
3:05:17	3:05:51	00:34
	Total Time	**00:34**

TECHNICAL MEMORANDUM

DATE: December 12, 2016

TO: Kim Keeling
City of Redmond

FROM: Amy Wasserman
TENW

SUBJECT: Summary of November 2016 TMP Monitoring Study
Redmond Elementary School
TENW Project No. 5263

This memorandum summarizes the results of the November 2016 Transportation Management Program (TMP) monitoring study for Redmond Elementary School. The monitoring study followed the requirements as defined in Section IV Program Review of the approved Redmond Elementary School TMP. A copy of the approved TMP is included in Attachment A. The TMP monitoring requirements include quantifying the duration of queue spillover onto 169th Ave NE and NE 80th Street and a summary of any off-site pick-up and drop-off activity on adjacent streets and reporting the results to the City. The TMP monitoring requirements also include the electronic transmittal of any corresponding video data to the City of Redmond.

Drop-Off/Pick-Up Queue Spillover onto 169th Ave NE

TENW collected video data on 169th Ave NE adjacent to Redmond Elementary School to determine the "duration of vehicle queue spillover" onto 169th Ave NE. The "duration of vehicle queue spillover" is defined as the continuous number of minutes that a vehicle queue extends from the main site entrance driveway and causes a blockage of vehicular through traffic on 169th Ave NE. Vehicles waiting to enter the driveway due to yielding to through traffic or pedestrians do not constitute "queue spillover."

The video data was collected on Tuesday, November 15, 2016 and Thursday, November 17, 2016 ("normal" school days) during the peak AM drop-off period (8:30 to 9:15 a.m.) and the peak Afternoon pick-up period (3:10 to 3:50 p.m.). The video data will be transmitted to the City of Redmond separately.

Table 1 summarizes the November 2016 duration of queue spillover (in minutes and seconds) onto 169th Ave NE during the AM and Afternoon peak periods. A more detailed summary of the queue spillover is included in Attachment B.

Table 1
November 2016 Duration of Queue Spillover onto 169th Ave NE

	Duration of Queue Spillover		
Peak Period	Tuesday 11/15/16	Thursday 11/17/16	Two-Day Average
AM Drop-Off (8:30 to 9:15 a.m.)	0 min 0 sec	0 min 0 sec	0 min 0 sec
Afternoon Pick-Up (3:10 to 3:50 p.m.)	0 min 0 sec	0 min 0 sec	0 min 0 sec

Based on TENW's review of the November 2016 video data collected on 169th Ave NE, the 2-day average duration of queue spillover onto 169th Ave NE was 0 seconds during the AM peak period and 0 seconds during the Afternoon peak period.

The Maximum Acceptable Level (MAL) of queue spillover (in minutes) for both the AM and Afternoon peak periods was defined in the TMP dated 2/23/16 (see Attachment A) and was based on observations conducted in October 2015. A summary of the current (November 2016) duration of queue spillover compared to the October 2015, February 2016, and April 2016 observed queue spillover and the MAL duration of queue spillover (as defined in the TMP) is included in Table 2.

Table 2
Summary of Queue Spillover Onto 169th Ave NE

	2-Day Average Duration of Queue Spillover (min:sec)				
Peak Period	Maximum Acceptable Level (MAL) per TMP	October 2015	February 2016	April 2016	November 2016 (current)
AM Peak	0:30	0:06	0:00	0:00	0:00
AM Peak MAL Requirements Met? [1]		N/A	**YES**	**YES**	**YES**
Afternoon Peak	1:00	2:03	0:13	4:14	0:00
Afternoon Peak MAL Requirements Met? [1]		N/A	**YES**	NO	**YES**

1. MAL requirements are met if the duration of queue spillover is less than or equal to the MAL for both the AM and Afternoon peak periods. The October 2015 observations were conducted prior to establishment of the MAL so they do not apply towards the MAL requirements as defined in the TMP.

As shown in Table 2, the November 2016 duration of queue spillover onto 169th Ave NE is less than the MAL for both the AM and Afternoon peak periods.

It should be noted that although the TMP requirements included specifying the duration of queue spillover onto 169th Ave NE and NE 80th Street, the duration of vehicle queue spillover was not observed to extend to NE 80th Street during any of the observation periods.

Off-Site Drop-off and Pick-Up Activity

Video observations were conducted at Redmond Elementary School over a two-day study period (Tuesday, November 15, 2016 and Thursday, November 17, 2016) during the AM peak drop-off period (8:30 to 9:15 AM) and during the Afternoon peak pick-up period (3:10 to 3:50 PM). The two-day study included counts of all school-related drop-offs and pick-ups on the following streets adjacent to the school:

- NE 83rd Street from 166th Ave NE to 167th Ave NE
- NE 80th Street from 166th Ave NE to 170th Ave NE
- 169th Ave NE from NE 80th St to NE 82nd St

A summary of the drop-off and pick-up activity on the streets defined above is included in Table 3. The detailed drop-off and pick-up data is included in Attachment C.

Table 3
November 2016 Summary of Off-Site Drop-Offs and Pick-Ups

	2-Day Average Off-Site Vehicle Trips					
	AM Peak Drop-Off Period (8:30 to 9:15 AM)			Afternoon Peak Pick-Up Period (3:10 to 3:50 PM)		
Off-Site Location	In	Out	Total	In	Out	Total
NE 83rd St (166th Ave NE to 167th Ave NE)	3	3	6	6	6	12
NE 80th St (166th Ave NE to 170th Ave NE)	46	46	92	25	29	54
169th Ave NE (NE 80th St to NE 82nd St)	4	4	8	9	9	18
TOTAL	**53**	**53**	**106**	**40**	**44**	**84**

As shown in Table 3, during the AM peak period, a 2-day average of 53 vehicles utilized on-street parking on the off-site streets for student drop-off. As also shown in Table 3, during the Afternoon peak period, a 2-day average of 40 vehicles utilized on-street parking on the off-site streets for student pick-up.

Conclusion and Next Steps

The November 2016 monitoring study showed that the two-day average duration of queue spillover onto 169th Ave NE was less than the Maximum Acceptable Level (MAL) as defined in the TMP for both the AM peak period and the Afternoon peak period. The TMP Monitoring requirements state that MAL must be met for three consecutive monthly monitorings.

Since three consecutive monthly monitoring results (February 2016, April 2016, and October 2016) show that the MAL has been met for the AM peak period (see Table 2), annual monitoring for the AM peak period will now be conducted until 2 consecutive annual monitoring results show the MAL has been met for the AM peak period, upon which the City and LWSD will meet to discuss future monitoring requirements.

Since the MAL has not been met for three consecutive monthly monitorings during the Afternoon peak period (see Table 2), monitoring will be conducted again for the Afternoon peak period at Redmond Elementary in February 2017.

If you have any questions, please feel free to contact me at (425) 466-7072 or amy@tenw.com.

cc: Brian Buck, Lake Washington School District
Michael Romero, Lake Washington School District
Jeff Haynie, P.E., Principal – TENW

Attachments

ATTACHMENT A

Redmond Elementary Approved TMP (2/23/16)

Lake Washington
School District

TRAFFIC MANAGEMENT PROGRAM
REDMOND ELEMENTARY SCHOOL

Redmond Elementary School is located at 16800 NE 80th Street in Redmond. The school currently accommodates 473 students in grades K-5, with 64 staff and teachers supporting the instructional and facility activities. The school operates 180 days of regular instruction, with 20% of those being early dismissal days which results in different pick-up times. The class day begins at 9:00 AM and ends at 3:30 PM. By contract, full-time faculty/staff arrive by 8:30 AM and depart no earlier than 4:01 PM. The school is currently in operation.

The Redmond Elementary Addition project would consist of two phases with the first phase including the addition of 4 portables to the site that would be in place for the 2015-2016 school year. Per LWSD, each portable has a capacity of 23 students so the proposed portables could increase the capacity of Redmond Elementary School by up to 92 students and 4 staff.

The second phase of the project would include an approximate 11,000 square foot (sf) addition that would be in place for the start of the 2016-2017 school year and requires another TMP. Per LWSD, the proposed addition could increase the capacity of the school by up to 161 students and 7 staff.

I. Program Objective
This Traffic Management Program is intended to manage the on-site traffic at Redmond Elementary School at and around school start and dismissal times, and includes elements to eliminate impacts to adjoining neighborhoods and streets.

II. Program Goal
This Traffic Management Plan aims to manage the on-site traffic operations during peak drop-off and pick-up times (8:30-9:15 AM and 3:10-3:50 PM) and minimize the duration of vehicle queue spillover onto 169th Ave NE and NE 80th Street. The "duration of vehicle queue spillover" is defined as the continuous number of minutes that a vehicle queue extends from the main site entrance driveway and causes a blockage of vehicular through traffic on 169th Ave NE. It should be noted that at present, there is no vehicle queue that extends onto either 169th Ave NE or NE 80 Street during peak drop-off and pick-up times.

TARGETS	**Duration of Queue Spillover (AM peak)**	**Duration of Queue Spillover (PM peak)**
Current	6 seconds	2 min; 3 seconds
Maximum Acceptable Level (MAL)*	30 seconds	1 minute
Goal	0 minutes	0 minutes

*LWSD and the City of Redmond established the MAL after the first monitoring period in October 2015.

III. Program Elements
A. <u>On-Site Elements</u>
- Assign up to 2 paid staff to manage on-site operations and move vehicles forward
- Training (flagger certification class and on-site training/instruction sheets)

- 106 parking stalls are available for staff (60) and visitors (46), including six (6) ADA parking stalls. Eight parking stalls are marked for visitors; the remaining stalls are not delineated as visitor or staff. 85% of the staff are on site concurrently, and 95% of the staff are assumed to drive a single-occupancy vehicle.
- 2 bike racks are available to accommodate 18 bicycles (When the number of bicycles exceeds the current capacity, the district will install additional bike racks)
- Temporary and permanent directional signage (sandwich boards, cones, etc.)
- Maintain separate bus loop with signage "Bus Lane Only".

B. Off-Site Elements

- Assign staff to be located off-site to manage the pedestrian crossings adjacent to the school:
  - the crosswalks on the east and south sides of the intersection of 168th Ave NE/NE 80th Street – crossing N/S and E/W
  - the crosswalk on the north side of the intersection of 169th Ave NE/NE 80th Street – crossing E/W
  - the crosswalk on the south side of the intersection of 169th Ave NE/NE 80th Street – crossing E/W
- Message to parents through monthly newsletter to parents, PTSA presentations, etc. Topics include:
  - On-site traffic flow and drop-off/pick-up procedures.
  - Safe-walk routes
  - Encouraging parents to have children walk to school
- Provide Transportation Information Center for parents and students. The exact medium to use has not been determined (bulletin board or website). Comments and suggestions will be collected and shared with the City in our annual report (See section IV) or upon request.

IV. Program Review

LWSD will conduct a monitoring study of the traffic operations at Redmond Elementary three times per year in the months of October, February and April. The studies shall be at the district's sole expense, and will be conducted and summarized by a 3rd party vendor selected by the district with professional training in conducting such studies. Video data will be provided to the City of Redmond electronically.

Monitoring shall include quantifying the duration of queue spillover onto 169th Ave NE & NE 80 Street during the peak drop-off and pick-up periods. Monitoring shall also include a summary of any off-site pick-up and drop-off activity in adjacent neighborhoods or on adjacent streets (169th Ave. NE between NE 80th and NE 82nd Streets; on NE 80th St. between 166th Ave. NE and 170th Ave. NE; on NE 83rd St. between 166th Ave. NE and 167th Ave. NE)

Monitoring will continue until 3 consecutive monthly monitoring results show the MAL has been met (after the MAL is established in October 2015), upon which monitoring will be conducted annually in the spring. When 2 consecutive annual monitoring results show the MAL has been met, the LWSD and the City will meet to discuss future monitoring requirements.

An annual report on the TMP activities and progress towards meeting the TMP targets will be prepared and submitted to the City of Redmond Transportation

Programs Administrator by July 31 of each year (or date agreed upon mutually by LWSD and the City).

V. Contingency Measures

Following the establishment of the MAL, in the event that 3 consecutive monthly TMP reports or 2 consecutive annual TMP reports show that levels in Section II are not being met, LWSD will implement the following sequentially:

1. Develop alternative strategies to manage vehicles efficiently that are acceptable to the City; or
2. Construct physical improvements at the site to accommodate enough vehicles to meet the "Goal"; or
3. Leave the new portables unoccupied until such time that LWSD demonstrates, to the City's satisfaction, the ability to meet the MAL

VI. Staff Training

The Lake Washington School District will engage a qualified traffic safety training firm to train District staff in managing vehicular and pedestrian traffic. The training program will follow the outline below:

- Conduct an on-site classroom training session during the last half of August when staff returns to the school.
- Engage training staff to be on site one day per week each of the first three weeks of the school year to provide hands on assistance
- LWSD will monitor the effectiveness of on-site traffic management personnel and utilize ESC for additional training as needed.

VII. Nature of Obligation

The property owner agrees to inform subsequent owners and/or lessees of all or part of the site covered by this Traffic Management Plan, that RZC Section 21.52.020 (or its successor) contains specific requirements pertaining to maintenance of a Traffic Management Plan. Owners and/or lessees should consult the Redmond Zoning Code and/or City of Redmond staff regarding current code requirements for Traffic Management Plan.

Lake Washington
School District

This Traffic Management Plan is approved by:

LAKE WASHINGTON SCHOOL DISTRICT

BY: _____

Signature | Date

Forrest Miller | Director of Support Services

Printed Name | Title

CITY OF REDMOND

BY: Kim Keeling | 2/23/16

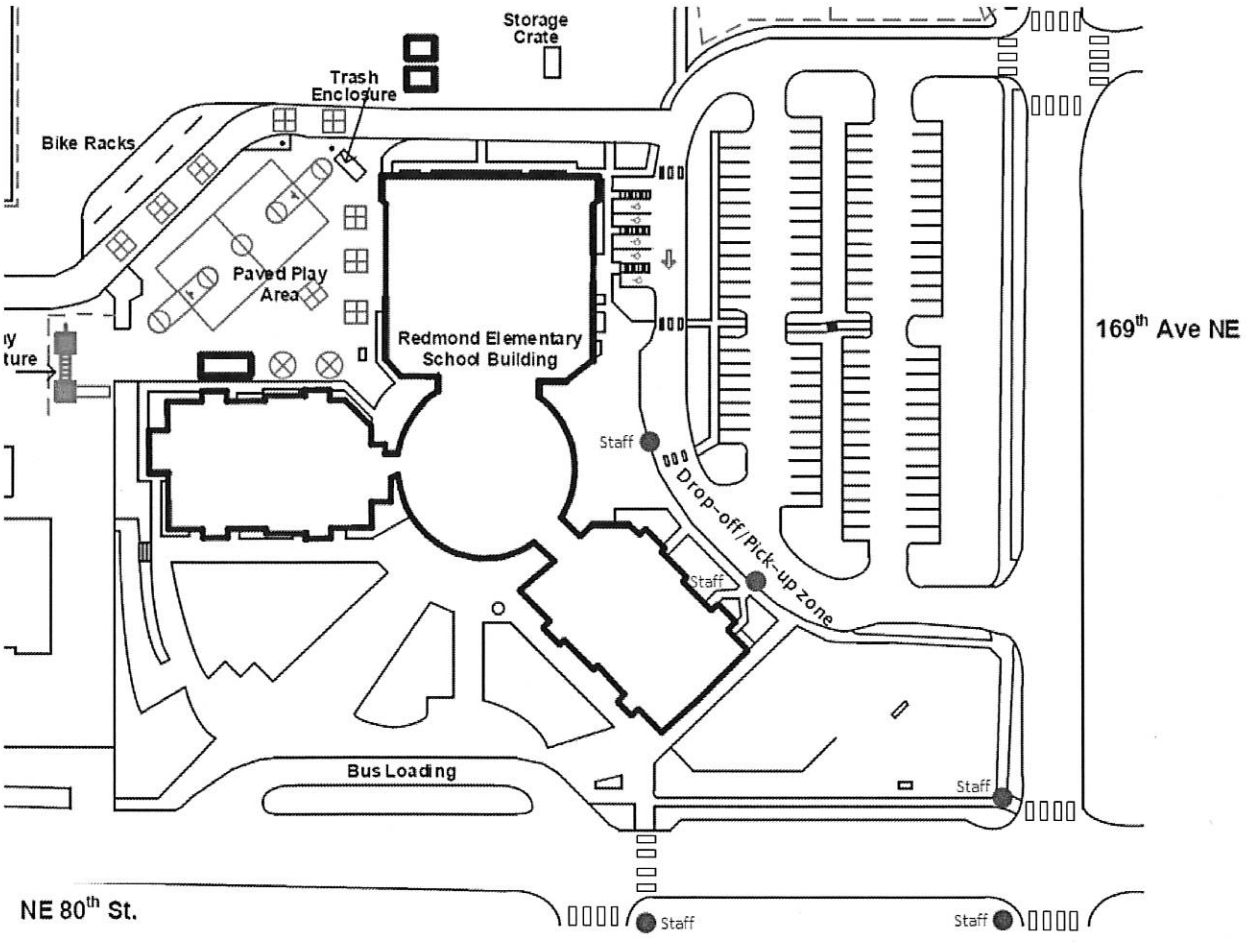
Signature | Date

Kim Keeling | Transportation Programs Administrator

Printed Name | Title

Lake Washington
School District

Redmond Elementary School Parking & Vehicle Circulation Layout Map



ATTACHMENT B

Duration of Queue Spillover on 169th Ave NE

LWSD - Redmond Elementary
November 2016 TMP Monitoring Study

Duration of Queue Spillover on 169th Ave NE

8:30 - 9:15 AM

	Total Queue Spillover (min/sec)
Tuesday 11/15/16	00:00
Thursday 11/17/16	00:00
2-Day Average	**00:00**

3:10 - 3:50 PM

	Total Queue Spillover (min/sec)
Tuesday 11/15/16	00:00
Thursday 11/17/16	00:00
2-Day Average	**00:00**

LWSD - Redmond Elementary
November 2016 TMP Monitoring Study

Duration of Queue Spillover onto 169th Ave NE
TUESDAY 11/15/16

AM PEAK PERIOD (8:30 - 9:15 AM)

Queue Spillover (Blockage)		
Time Start	**Time End**	**Total Time (min/sec)**
Total Time		**00:00**

AFTERNOON PEAK PERIOD (3:10 - 3:50 PM)

Queue Spillover (Blockage)		
Time Start	**Time End**	**Total Time (min/sec)**
Total Time		**00:00**

LWSD - Redmond Elementary
November 2016 TMP Monitoring Study

Duration of Queue Spillover onto 169th Ave NE
THURSDAY 11/17/16

AM PEAK PERIOD (8:30 - 9:15 AM)

Queue Spillover (Blockage)		
Time Start	**Time End**	**Total Time (min/sec)**
Total Time		**00:00**

AFTERNOON PEAK PERIOD (3:10 - 3:50 PM)

Queue Spillover (Blockage)		
Time Start	**Time End**	**Total Time (min/sec)**
Total Time		**00:00**

ATTACHMENT C

Detailed Off-Site Drop-Off and Pick-Up Data

Redmond Elementary School
TMP Monitoring Study
TENW Project #5263

Summary of Off-Site Drop-Off and Pick-Up Activity - November 2016

AM Peak Period (8:30 a.m. to 9:15 a.m.)

	Off-Site Drop-Offs								
	NE 83rd St (between 166th Ave NE & 167th Ave NE)		NE 80th St (166th Ave NE to 170th Ave NE)		169th Ave NE (NE 80th St to NE 82nd St)		**TOTAL Off-Site Drop-Offs**		
Day	In	Out	In	Out	In	Out	**In**	**Out**	**Total**
Tuesday 11/15/16	2	2	48	48	3	3			
Thursday 11/17/16	3	3	44	44	5	5			
2-Day Average	3	3	46	46	4	4	**53**	**53**	**106**

Afternoon Peak Period (3:10 p.m. to 3:50 p.m.)

	Off-Site Pick-Ups								
	NE 83rd St (between 166th Ave NE & 167th Ave NE)		NE 80th St (166th Ave NE to 170th Ave NE)		169th Ave NE (NE 80th St to NE 82nd St)		**TOTAL Off-Site Pick-Ups**		
Day	In	Out	In	Out	In	Out	**In**	**Out**	**Total**
Tuesday 11/15/16	6	6	25	33	10	10			
Thursday 11/17/16	5	5	24	24	8	7			
2-Day Average	6	6	25	29	9	9	**40**	**44**	**84**

Redmond Elementary School
TMP Monitoring Study
TENW Project #5263

Tuesday, November 15, 2016

AM Peak Drop-Off Period

	A - NE 83rd St (between 166th Ave NE & 167th Ave NE)		B - NE 80th St (west of bus lane exit only)		C - NE 80th St (bus lane exit only to 168th Ave NE)		D - NE 80th St (168th Ave NE to 169th Ave NE)		E - NE 80th St (169th Ave NE to 170th Ave NE)		F - 169th Ave NE (NE 80th St to NE 82nd St)		**TOTAL Off-Site Drop-Offs**		
Time period starting	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	**In**	**Out**	**Total**
8:30 AM	0	0	7	5	1	0	7	5	0	0	1	0	**16**	**10**	**26**
8:45 AM	2	2	11	7	6	6	11	13	1	1	2	2	**33**	**31**	**64**
9:00 AM	0	0	4	10	0	1	0	0	0	0	0	1	**4**	**12**	**16**
45-minute total	2	2	22	22	7	7	18	18	1	1	3	3	**53**	**53**	**106**

Afternoon Peak Pick-Up Period

	A - NE 83rd St (between 166th Ave NE & 167th Ave NE)		B - NE 80th St (west of bus lane exit only)		C - NE 80th St (bus lane exit only to 168th Ave NE)		D - NE 80th St (168th Ave NE to 169th Ave NE)		E - NE 80th St (169th Ave NE to 170th Ave NE)		F - 169th Ave NE (NE 80th St to NE 82nd St)		**TOTAL Off-Site Pick-Ups**		
Time period starting	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	**In**	**Out**	**Total**
3:10 PM	0	0	4	0	4	0	2	0	0	0	0	0	**10**	**0**	**10**
3:20 PM	1	0	6	0	1	0	2	0	1	0	10	1	**21**	**1**	**22**
3:30 PM	4	4	3	14	0	4	1	8	1	2	0	7	**9**	**39**	**48**
3:40 PM	1	2	0	2	0	1	0	2	0	0	0	2	**1**	**9**	**10**
40-minute total	6	6	13	16	5	5	5	10	2	2	10	10	**41**	**49**	**90**

Redmond Elementary School
TMP Monitoring Study
TENW Project #5263

Thursday, November 17, 2016

AM Peak Drop-Off Period

	A - NE 83rd St (between 166th Ave NE & 167th Ave NE)		B - NE 80th St (west of bus lane exit only)		C - NE 80th St (bus lane exit only to 168th Ave NE)		D - NE 80th St (168th Ave NE to 169th Ave NE)		E - NE 80th St (169th Ave NE to 170th Ave NE)		F - 169th Ave NE (NE 80th St to NE 82nd St)		**TOTAL Off-Site Drop-Offs**		
Time period starting	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	**In**	**Out**	**Total**
8:30 AM	2	1	5	1	0	0	5	3	0	0	0	0	**12**	**5**	**17**
8:45 AM	1	2	18	18	4	2	9	9	1	1	5	2	**38**	**34**	**72**
9:00 AM	0	0	2	6	0	1	0	3	0	0	0	3	**2**	**13**	**15**
45-minute total	3	3	25	25	4	3	14	15	1	1	5	5	**52**	**52**	**104**

Afternoon Peak Pick-Up Period

	A - NE 83rd St (between 166th Ave NE & 167th Ave NE)		B - NE 80th St (west of bus lane exit only)		C - NE 80th St (bus lane exit only to 168th Ave NE)		D - NE 80th St (168th Ave NE to 169th Ave NE)		E - NE 80th St (169th Ave NE to 170th Ave NE)		F - 169th Ave NE (NE 80th St to NE 82nd St)		**TOTAL Off-Site Pick-Ups**		
Time period starting	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	**In**	**Out**	**Total**
3:10 PM	0	0	5	0	1	0	5	0	0	0	0	0	**11**	**0**	**11**
3:20 PM	1	0	6	0	1	0	2	0	1	0	5	0	**16**	**0**	**16**
3:30 PM	3	2	1	10	0	2	2	7	0	1	2	3	**8**	**25**	**33**
3:40 PM	1	3	0	1	0	0	0	3	0	0	1	4	**2**	**11**	**13**
40-minute total	5	5	12	11	2	2	9	10	1	1	8	7	**37**	**36**	**73**