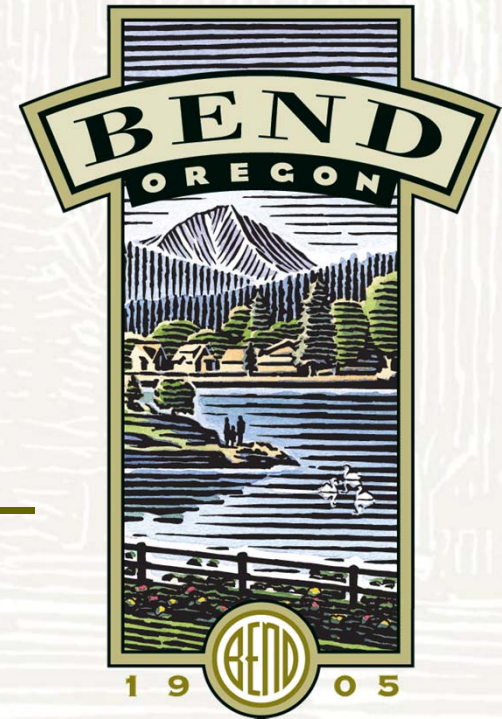


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# 15<sup>th</sup> and Reed Market Roundabout Train Mitigation

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**City Council  
December 19, 2012**

# Preliminary Roundabout Layout



City of Bend, Oregon

# 15<sup>th</sup> and Reed Market Intersection



Concern about congestion due to the train identified at:

- Neighborhood Association Meetings
- Public Open Houses
- Design Workshops
- Internal Engineering Meetings

As a result, video monitoring of train events was conducted from November 2 to November 8 to better understand:

- Frequency
- Duration
- Queuing impacts

# Train Occurrence Findings



- 73 events occurred over the seven (7) day period (see Figure 1)
- Average crossing duration was approximately three (3) minutes
- Maximum crossing duration was approximately nine (9) minutes
- 20 of the 73 events occurred during peak commute periods (see Table 1)
- 12 of the 73 events resulted in queues extending from railroad gates east toward 15<sup>th</sup> Street

# Train Crossing Events

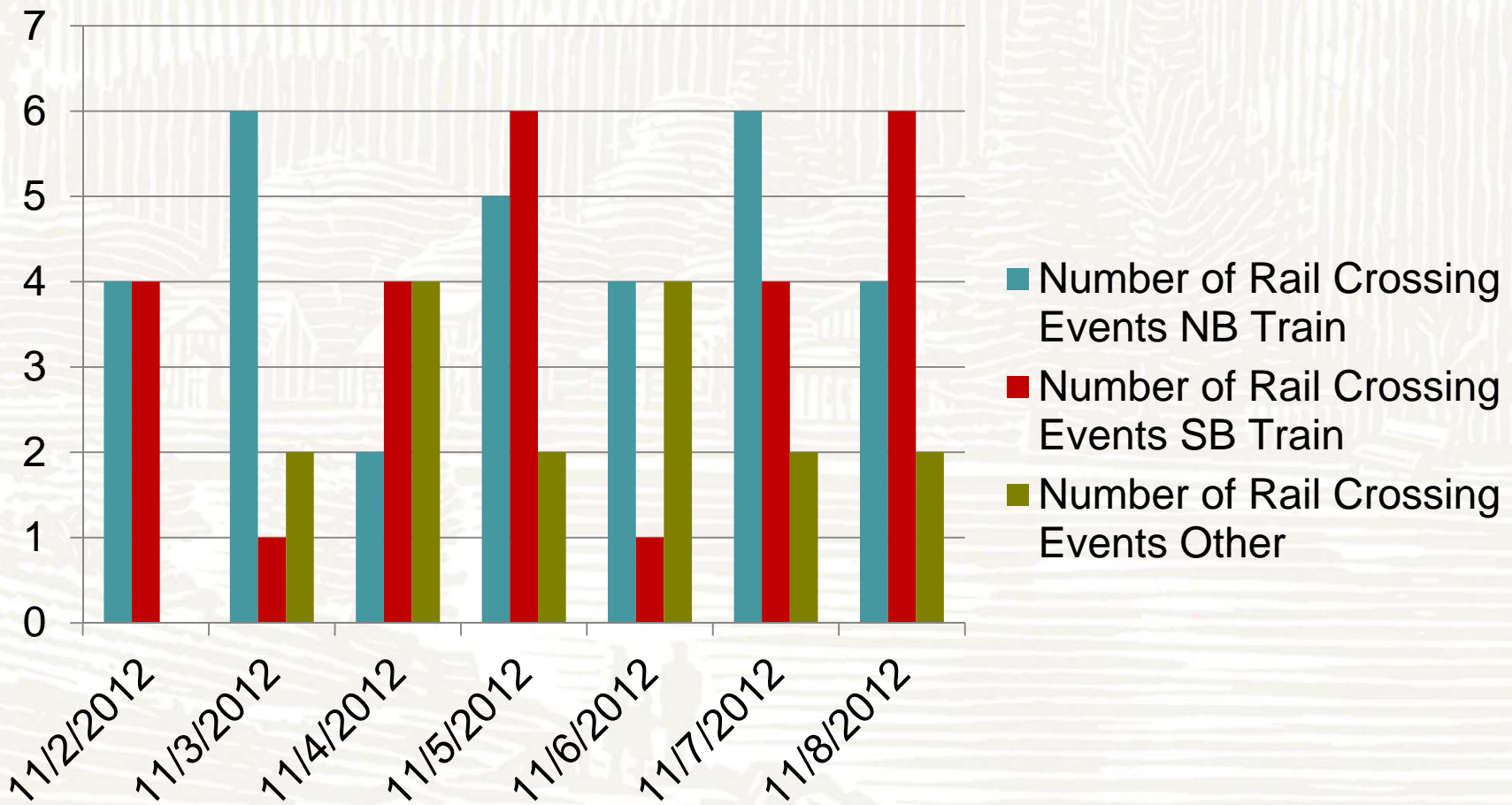


Figure 1: Reed Mkt Rail Crossing Events by Day

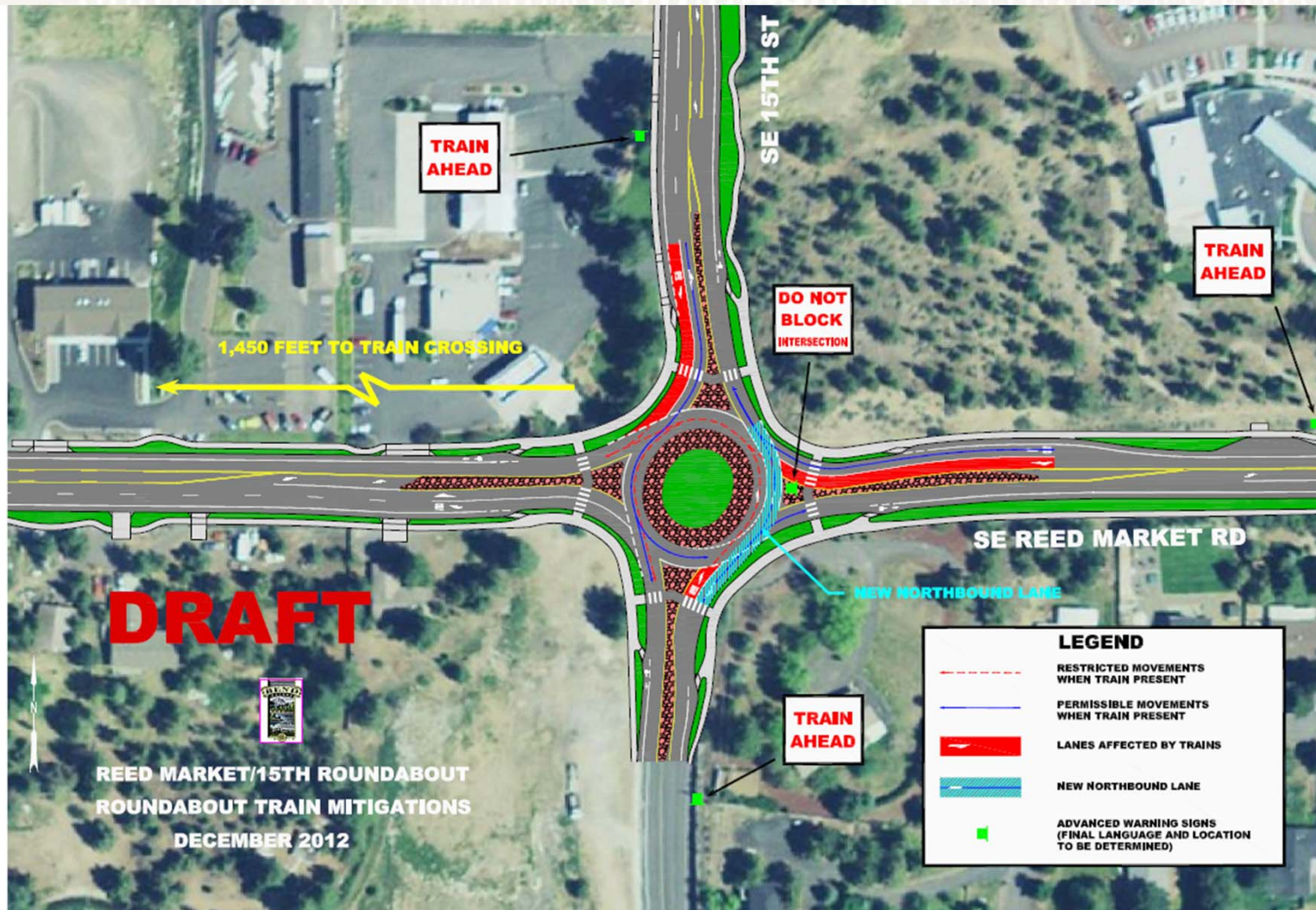
# Train Crossing Events Peak Periods



<b>Train Travel Direction</b>	<b>Morning Peak (7 - 9 am)</b>	<b>Afternoon Peak (11am – 1pm)</b>	<b>Evening Peak (3 – 5pm)</b>
Northbound	1	2	5
Southbound	6	2	1
Other (Switching / Maintenance)	1	0	2
<b>Total</b>	<b>8</b>	<b>4</b>	<b>8</b>
<b>Ave Rail Crossing Duration (min:sec)</b>	<b>2:23</b>	<b>5:19</b>	<b>1:17</b>

Table 1: Reed Mkt Rail Crossing Events during Peak Periods

# 15<sup>th</sup> and Reed Market Mitigation



# Recommendations for Mitigation



## Recommendations:

- Additional northbound entry and circulating lane
- Advance warning signs that activate when train is present; “train ahead”
- Restrictive signs that activate when train is present; “do not block intersection”

## Primary Reasons for Selecting Proposed Mitigations:

- Reasonable costs with high effectiveness to mitigate for trains
- MUTCD compliant
- Maintains traffic operations during train event
- Supports emergency response by maintaining traffic operations

## Options considered but not advanced due to installation costs compared to the operational benefits:

- Do nothing, continue studying intersection, impacts and driver behavior
- Permanent signs such as “do not block intersection”
- Traffic signal at entry legs restricting entry to roundabout during crossing events
- Traffic gates at entry legs physically restricting entry into roundabout during crossing events



# Public Outreach and Studies

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- Reed Market Corridor Study that included open houses ; study assumes roundabouts at most intersections. Parametrics, Inc. (2004-2005)
- Reed Market Corridor Study Summary Report. Parametrics, Inc. June 2006.
- Reed Market Road 9<sup>th</sup> Street to Newberry Drive 30 Percent Design Summary. Otak, Inc, (August 2008)
- Open House to receive public input on projects to be included in 2011 City of Bend Transportation G.O. Bond (February 2011)
- Voter approval for Reed Market Improvements that includes multi lane roundabout at 15<sup>th</sup> and Reed Market (May 2011)
- Old Farm District Neighborhood Association (OFDNA) general meeting (April 2012)
- Reed Market Design Public Workshop #1(August 2012)
- Old Farm District Neighborhood Association (OFDNA) Board meeting (September 2012)
- Old Farm District Neighborhood Association (OFDNA) general meeting(October 2012)
- Reed Market Design Public Workshop #2 (November 2012)