



November 4, 2024

City Council of the City of Boardman
200 City Center Circle
P.O. Box 229
Boardman, OR 97818

RE: CUP24-000001 Transportation Impacts

Dear Mayor Keefer and Council Members:

Greenlight Engineering has been asked by Hattenhauer Distributing Co. to evaluate the proposed conditional use transportation improvement to install a High-Intensity Activated CrossWalk ("HAWK") signal at the N. Main Street/Boardman Avenue NE and a median at N. Main Street/Front Avenue in Boardman, Oregon (collectively, the "Project"). At the last moment, according to the City's Findings of Fact distributed late in the evening on October 30, 2024, the City of Boardman appears to have changed the approach away from a HAWK to instead install a traffic signal and to install a median between N. Main Street/Front Avenue and N. Main Street/Boardman Avenue NE (collectively, the "Modified Project").

Executive Summary

- There is no evidence that a traffic signal is warranted at the N. Main Street/Boardman Avenue NE intersection per the Manual on Uniform Traffic Control Devices (MUTCD) under existing conditions. The City is required to comply with the MUTCD. I have provided evidence that a traffic signal is not warranted under existing conditions based upon the traffic data presented in the City's Technical Memorandum. The City has provided evidence that a traffic signal may be warranted in the year 2042 based on a planning level analysis and their analysis is based on significantly different traffic volumes than exist today. Additionally, that analysis is not based on the actual MUTCD traffic signal warrants and the City has not conducted an engineering study based on those traffic signal warrants.
- The City continues to ignore the adopted IAMP triggers for making access modifications triggers at the N. Main Street/Front Avenue intersection. None of the triggers are met for restricting access at that intersection. In the absence of evaluating the actual criteria, the City has commissioned and relies heavily on a "near miss" study without reference to any industry standard or science that illustrates there are very few actual near misses.
- The evidence illustrates that reported crashes have dropped at the N. Main Street/Boardman Avenue NE intersection and the N. Main Street/Front Street intersections since the IAMP was adopted.
- The evidence illustrates that the N. Main Street/Boardman Avenue NE and N. Main Street/Front Street intersections and N. Main Street between Boardman Avenue NE and Front Street all operate with adequate capacity and safety.

Analysis of Findings of Fact

In addition to my August 6, 2024 comments on previous and similar Findings of Fact, I have the following comments on the revised Findings of Fact. Many of the purported facts are not actually facts and/or are statements made by the City not supported by evidence.

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Analysis of Findings of Fact Regarding N. Main Street/Boardman Avenue NE Traffic Signal

The Findings of Fact state that “Kittleson (sic) conducted a corridor assessment and determined that signal warrants were justified and the streetlight was shown not to impact the interchange.”

The City has flipped their proposal from a traffic signal to a HAWK and now back to a traffic signal at the N. Main Street/Boardman Avenue NE intersection. In my August 6, 2024 report, I noted “The City previously proposed a full traffic (not a HAWK signal) based on the Technical Memorandum. However, the Technical Memorandum fails to provide evidence of the traffic volumes that were used in the traffic signal warrant analysis to establish that a traffic signal is warranted. The traffic signal warrant analysis is also based upon a future 2042 year.” At the time of my report, the City was not proposing a traffic signal and therefore, I provided very little evaluation of a traffic signal at the intersection.

In fact, Kittleson's Technical Memorandum found that preliminary signal warrants (which are not the same as MUTCD traffic signal warrants) may be met for the year 2042. Current traffic volumes are significantly lower than those projected in 2042. The preliminary traffic signal warrants are a starting point that should be not be used for determining whether a traffic signal is actually warranted, but to project whether a traffic signal may be warranted using very limited data. However, as the City proposes the installation of a traffic signal at this time, it appears the City believes a traffic signal is warranted today. In fact, there is no evidence that supports that implied conclusion. There is no engineering study that supports the installation of a traffic signal as is required by the MUTCD.

ODOT's “Preliminary Traffic Signal Warrant Analysis” form is just that, preliminary. The document itself makes this clear and notes that an engineering study is needed to determine whether a traffic signal is warranted. This planning level analysis falls well short of determining whether a traffic signal is actually warranted. The use of the Preliminary Traffic Signal Warrant Analysis is addressed in ODOT's Analysis Procedures Manual, which states “The preliminary warrants are generally not accepted as a basis for approving the installation of a traffic signal but are useful for projecting signalization needs for future years. Full warrants are evaluated later as part of the engineering study required by the MUTCD. Many other considerations go into determining whether a signal should be installed.” It is clear that the City's analysis falls well short of justification for a traffic signal, but the City has used it as such. There is no engineering study or any study based on MUTCD warrants that support the installation of a traffic signal as is required by the MUTCD before a traffic signal is installed.

As noted in my August 6, 2024 report, “The Manual on Uniform Traffic Control Devices (“MUTCD”) is the national standard for traffic control devices. The 2009 MUTCD is adopted in Oregon under OAR 734-020-0005. The City of Boardman is required to comply with the MUTCD.” The analysis conducted does not comply with the requirements of the MUTCD.

The MUTCD states:

“An engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location.

The investigation of the need for a traffic control signal shall include an analysis of factors related to the existing operation and safety at the study location and the potential to improve these conditions, and the applicable factors contained in the following traffic signal warrants:

- Warrant 1, Eight-Hour Vehicular Volume
- Warrant 2, Four-Hour Vehicular Volume
- Warrant 3, Peak Hour
- Warrant 4, Pedestrian Volume

Warrant 5, School Crossing
Warrant 6, Coordinated Signal System
Warrant 7, Crash Experience
Warrant 8, Roadway Network
Warrant 9, Intersection Near a Grade Crossing

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal...

...A traffic control signal should not be installed unless one or more of the factors described in this Chapter are met.

A traffic control signal should not be installed unless an engineering study indicates that installing a traffic control signal will improve the overall safety and/or operation of the intersection..."

Per the Technical Memorandum, the memorandum itself is a "a planning-level update" and is not an engineering study as is required when evaluating traffic signal warrants. This is further evidenced by the fact that the Technical Memorandum is not stamped by an Engineer.

The Technical Memorandum doesn't present sufficient data to actually evaluate the MUTCD's traffic signal warrants as the warrants require hourly traffic count information throughout the day on N. Main Street and Boardman Avenue NE. That data has not been provided or evaluated. The typical traffic signal warrants that are considered when determining compliance with the MUTCD are based upon "Warrant 1, Eight-Hour Vehicular Volume" and "Warrant 2, Four-Hour Vehicular Volume." In order to meet Warrant 1, the warrant requires a certain level of traffic volumes to be sustained on the main street and minor street for at least eight hours of the day. Similarly, Warrant 2 requires certain volume thresholds to be met at least four hours of the day. Thus far, the City has only provided weekday PM peak hour volumes. Like the other signal warrants, there is no evidence that either Warrant 1 or Warrant 2 are met. **Based upon the existing traffic volumes presented in the Technical Memorandum, neither Warrant 1 or 2 are met at the N. Main Street/Boardman Avenue NE as the minimum traffic volumes are not even met during the existing weekday PM peak hour, and the volumes are not even close to meeting these warrants during the peak hour.** Given that PM peak hour typically experiences the highest hourly volume of the day, it is likely that no hours meet the minimum volume threshold to justify installation of a traffic signal at this time.

Relying on preliminary traffic signal warrants based on a future year of 2042 and without an engineering study that illustrates compliance with the MUTCD puts the City at legal risk if a traffic signal were to be approved and installed.

The Findings of Fact state:

"Staff have also determined that the traffic signal is warranted based on the following:

- While not within the standard time frame for consideration there has been a pedestrian loss of life at this intersection.
- This intersection is a primary school crossing area for Riverside High School during the arrival, lunch, and departure times. Use of the current RRFB creates backups along Main Street impacting the west bound off ramp queuing and can result in traffic backing up into the west bound Interstate 84 travel lane. This is further discussed on page 7 of the Kittelson & Associates analysis that is attached.
- Pedestrian volume outside of school pedestrian usage continues to increase along Main Street.
- Crash data from 2016 through 2020 identified in the Kittelson & Associates report shows that there are a variety of different types of crashes throughout the study corridor.
- The near miss video compilation confirms staffs concerns that current traffic volumes create limited spacing for turning maneuvers causing drivers to drive more aggressively creating

opportunities for accidents with other vehicles and pedestrians.”

The Findings of Fact inexplicably attempt to replace the MUTCD traffic signal warrants with new set of criteria to justify a traffic signal. The City of Boardman is required to comply with MUTCD warrants.

While there was an unfortunate loss of life at the intersection, the intersection has been mitigated with an RRFB. The Technical Memorandum illustrates that just one crash has occurred at the intersection from 2016-2020, so there is not apparently a significant safety issue. The MUTCD traffic signal warrants do include the consideration of intersection crashes, but there is no evidence that those traffic signal warrants were analyzed per the MUTCD.

While the intersection does serve students, the City has failed to quantify the “backups” created by the RRFB. Additionally, there is no traffic signals warrants based on backups. The video prepared by the City does not show backups at the intersection.

There is no evidence that “Pedestrian volumes outside of school pedestrian usage continues to increase along Main Street.”

The crash data from 2016 through 2020 does illustrate that there are a variety of crash types in the study corridor, but the City fails to provide any explanation why that fact would warrant a traffic signal at the N. Main Street/Boardman Avenue NE intersection. In terms of signalization at the N. Main Street/Boardman Avenue NE intersection, only the crashes at the intersection itself should be considered as part of analyzing traffic signal warrants. Crash history can be considered as part of evaluating MUTCD traffic signal warrants although the Technical Memorandum reports that there was only one crash at the N. Main Street/Boardman Avenue NE intersection from 2016-2020. Thus, the traffic signal warrant based on crashes would not be met at the intersection.

The City has failed to provide any industry references regarding the science or methodology behind their near miss study as such a study is not industry standard. It is unclear how the near miss methodology was developed and whether this methodology was developed by the traffic counting company that provided the study or was developed based upon scientific research. The City has failed to provide reference to any connection from so-called near misses to actual safety. There is no engineering analysis that offers any conclusions about the near miss study. The Findings of Fact point to vague unnamed staff concerns with unknown expertise. Below, in the absence of any other engineering analysis, I analyzed the near miss study in detail. Near misses are not mentioned as part of evaluating traffic signal warrants per the MUTCD. The City has failed to provide an engineering study evaluating MUTCD warrants. It should be noted that an engineering study must be conducted by a licensed Professional Engineer. It is unclear whether City staff without the necessary expertise and licensure to comment on traffic control and safety are making complicated traffic engineering recommendations/decisions that should be made by Engineer.

The Findings of Fact state:

“Safety is one of the primary reasons for pursuing the street light project based on the loss of life from some years ago along with the reporting of a significant number of near misses with both cars and pedestrians. Based on commentary within the community and staff concerns about near misses a near miss analysis has been completed with a surprising number of potential incidents called out in the video that has been delivered.

Pedestrian, and by extension bicycle, movement and safety will be improved with the traffic signal allowing for protected crossing times and spacing those crossing times to reduce if not eliminate backups along Main Street that can currently affect the queuing of west bound travelers on the west bound Interstate 84 off ramp.”

After the fatal crash, the City installed an RRFB. While the Technical Memorandum notes that the RRFB occasionally causes backups, there is not substantial evidence to support the claim of backups. The City has not quantified or provided analysis illustrating these backups nor quantified a large number of pedestrian crossings at the N. Main Street/Boardman Avenue NE. The traffic counts of the Technical Memorandum illustrate a very small amount of pedestrian crossings. While the City states that pedestrian volumes are increasing, there is no evidence to support that statement. The analysis of a potential traffic signal at the N. Main Street/Boardman Avenue NE is based on a very small amount of pedestrian crossings (per the City's traffic counts). If there are indeed, a great number of pedestrian crossings, the City's traffic analysis with the traffic signal in place fails to take into account the negative impacts of pedestrians being served regularly and what backups may occur as a result of this large number of pedestrians with a traffic signal in place.

The City reports there is a significant number of near misses although they provide no references linking any science to their near miss analysis. The Findings of Fact vaguely refer to "commentary within the community and staff concerns about near misses" without reference.

The Findings of Fact state:

"Staff have determined that the traffic signal is consistent with the MS IAMP because it conforms to the Access Management Plan by:

- Continuing to restrict access to the interchange and interchange ramps and is, in fact, working to eliminate impacts to the interchange ramps from traffic that currently backs up when continual use of the RRFB causes delays of northbound travelers on Main Street.
- Improve safety factors not only within the interchange but also along Main Street and at this intersection in particular.
- Eliminating or reducing turning conflicts along the Main Street corridor at the Front Street intersection.
- Assuring that all current accesses are maintained to allow some level of ingress or egress and improving several accesses with improvements that also support pedestrian utilization."

In contrast to the findings, it is unclear how the traffic signal would "restrict access" although the Technical Memorandum references queuing impacts without quantifying them or providing substantial evidence of them. The Technical Memorandum fails to provide any analysis that establishes that a queuing issue exists. The Technical Memorandum fails to provide evidence of pedestrian counts that would result in queuing issues. The Technical Memorandum analyzes a traffic signal based on very low traffic counts and therefore fails to analyze how the traffic signal would operate under conditions of high pedestrian volumes. Additionally, there is no evidence a traffic signal is warranted at the intersection. The near miss video, collected over 28 hours, does not show any significant back-ups caused by the RRFB at the N. Main Street/Boardman Avenue NE intersection. The City has continually failed to provide quantifiable evidence of this queuing issue.

There is no evidence that a traffic signal would improve safety at the intersection. The Technical Memorandum illustrates that there is only one reported crash at the intersection from 2016 to 2020. There is also not substantial evidence that there is a safety issue at the interchange caused by the current operations at N. Main Street/Boardman Avenue NE intersection. Additionally, there is no evidence a traffic signal is warranted at the intersection based on current traffic volumes.

There is not substantial evidence that the traffic signal itself at N. Main Street/Boardman Avenue NE eliminates or reduces turning conflicts along the Main Street corridor or at the Front Street intersection. There is no evidence that supports the need to eliminate or restrict access along the Main Street corridor or at the Front Street intersection in order to install a traffic signal at the N. Main Street/Boardman Avenue NE intersection. The IAMP adopted triggers for the restriction of access at N. Main Street/Front Avenue that the City has thus far

ignored, although it is clear that the triggers are not met.

There is no apparent connection with the traffic signal in “assuring that all current accesses are maintained to allow some level of ingress or egress and improving several accesses with improvements that also support pedestrian utilization.” There is no evidence that with or without a traffic signal that any of the triggers are met that would result in access restriction. Additionally, N. Main Street between Front Street and Boardman Avenue NE has a very good safety record and per the Technical Memorandum, crashes have decreased since the IAMP as evidenced by Table 3 of the Technical Memorandum and Table 3.4 of the IAMP.

The Findings of Fact state that “Replacing the RRFB with a traffic signal will allow for smoother interaction between vehicle travel and pedestrian crossing, particularly at the Boardman Avenue intersection.” There isn't any evidence that a traffic signal will allow for smoother interaction between vehicle travel and pedestrian crossing and there is no definition of “smoother interaction.” There is evidence that a traffic signal is not warranted at the N. Main Street/Boardman Avenue NE intersection under current traffic volumes. It appears the City believes that a traffic signal at N. Main Street/Boardman Avenue NE will allow for smoother interaction between vehicle travel and pedestrian crossing at other locations, but there is no evidence that supports this statement.

The Findings of Fact state that “As discussed previously in these Findings of Fact there is already a stacking issue on Main Street that the upgrade from the RRFB to the traffic signal should mitigate reducing the stacking that currently occurs. This will be achieved as the traffic signal uses more advanced logic to balance the needs of the pedestrian crossing with motor vehicle needs.” The City has failed to quantify this stacking issue. The City speculates, but provides no evidence, that the upgrade from the RRFB to the traffic signal should mitigate the stacking issues. The traffic signal analysis is not based upon high pedestrian crossing volumes, so it is not based on the conditions that the City has alleged needs to be mitigated. Additionally, a traffic signal is not even warranted at this time.

The Findings of Fact state:

“The appellant is apparently arguing that staff have not applied all the applicable Conditional Use Permit criteria...Staff evaluated the criteria and found that the section applied (4.4.400) is specifically for Transportation System Facilities and Improvements and is most applicable. Section A discusses the Use Criteria and evaluates the site, which is a road improvement, reviews negative impacts which was a part of the analysis that was accomplished, and addresses public facility capacity which gets to the primary reason that the streetlight is proposed – to address the capacity and safety issues at Boardman Avenue and North Main Street...”

The Findings of Fact note that the primary reason that the streetlight (traffic signal) is proposed is to address capacity and safety issues at Boardman Avenue and N. Main Street. As evidenced by the Technical Memorandum, crashes have decreased at the intersection between the IAMP and the Technical Memorandum with only one reported crash from 2016 to 2020. The Technical Memorandum establishes that the intersection currently operates at LOS C, and certainly is not experiencing capacity issues. Additionally, a traffic signal is not warranted at the intersection under current conditions.

Analysis of Findings of Fact Regarding Median Along N. Main Street

The Findings of Fact state that "Installation of the center median is also justified to convert NW and NE Front Street to right-in/right-out and for traffic queueing/staging at the signalized intersection." There is no evidence that supports the installation of a median that would convert Front Street to a right-in/right-out. The City has failed to provide substantial evidence of stacking. Stacking is not adopted as any IAMP trigger for modifying the intersection. The intersection crashes have only decreased since the IAMP per the Technical Memorandum. There is no evidence or evaluation that connects the installation of a traffic signal at N. Main Street/Boardman Avenue NE with the need to install a median along N. Main Street, and certainly not to restrict the N. Main Street/Front Avenue intersection.

The IAMP states "It is important to establish thresholds for limiting the North and South Front Street access at Main Street so that decisions can be made through the land use review process, and as various traffic issues arise or the community reports significant conflicts." The City Council Findings of Fact states that "This area is subject to the Boardman Main Street Interchange Area Management Plan (MS IAMP) and any development or street projects within the Management Area must conform to the requirements of the IAMP." The IAMP provides the criteria for access based decisions at the intersection. Thus far, the City has ignored these IAMP triggers and failed to provide any analysis of the adopted criteria under which the decision to restrict traffic is supposed to be made. Significantly, the IAMP makes no references to "near misses" as a trigger.

As established in my August 14, 2024, report:

"In comparing previous crash data from the IAMP to the current crash data from the Technical Memorandum, the observed crash rates have actually decreased over time at N. Main Street/Front Avenue (from 0.17 crashes per million entering vehicles to 0.07) and N. Main Street/Boardman Avenue (from 0.20 to 0.09). All illustrate very low crash rates. As presented in my August 6, 2024 report, the number of crashes per year have decreased at the N. Main Street/Front Avenue intersection in the last 15 years."

As previously described, the IAMP clearly provides:

"Below is a description of when the improvements would be expected to be needed..."

Main Street & Front Avenue (North and South)

The traffic volumes at the intersections of Main Street & Front Avenue North and Main Street & Front Avenue South should be monitored as development occurs to determine if certain turning movements should be prohibited...

Triggers for access changes at Front Street North and Front Street South include:

- Side street level of service drops below LOS E (15-20 years from now)
- Traffic signal installed at the I-84 westbound ramp (10-15 years from now)
- Increase in crashes
- Bridge improvement project constructed (15-20 years from now)
- Recurring public complaints about conflicts and safety at these locations"

To date, the City has provided no evidence that any of these conditions exist. I have provided substantial evidence that these conditions do not exist. To recap, the evidence illustrates that the intersection operates at LOS C (although the City continues to erroneously state it operates at LOS D), there is no planned traffic signal at I-84 WB/N. Main Street, there has been no increase in crashes (but there has been a decrease since the IAMP), no bridge improvement project is planned for construction, and there have not been recurring public complaints about conflicts and safety at the intersection.

The Findings of Fact state:

“It should be noted that the MS IAMP says the following about access to Main Street in the vicinity of the Interchange: 'A key element of the IAMP is the long-range preservation of operational efficiency and safety of the interchange is the management of access to Main Street. Because access points introduce a number of potential vehicular conflicts on a roadway and are frequently the causes of slowing or stopping vehicles, they can significantly degrade the flow of traffic and reduce the efficiency of the transportation system. However, reducing the overall number of access points and providing greater separation between them can minimize the impacts of these conflicts.' The proposed center median and limiting left hand turns on North Main Street between Front Street and Boardman Avenue affectively (sic) achieves the intent of this statement without closing those accesses.”

The Findings of Fact continue:

“City staff have concluded that to implement the MS IAMP while maintaining public safety, a traffic signal is the best alternative for the intersection of Boardman Avenue and North Main Street. Additionally, the staff recommends converting the Front Street intersection to a right-in/right-out configuration for several reasons outlined here:

1. The City's Level of Service, or LOS, standard is C which is higher than ODOTs and allows for less congestion.
2. Access points introduce a number of potential vehicular conflicts on a roadway and are frequently the causes of slowing or stopping vehicles, they can significantly degrade the flow of traffic, and reduce the efficiency of the transportation types. Reducing the overall number of access points and providing greater separation between them can minimize the impacts of these conflicts. Reducing Front Street to a right-in/right-out configuration reduces a significant vehicular conflict adjacent to the west bound off-ramp.
3. At the time the MS IAMP was adopted the LOS for Main Street and North Front Street was C. Today it is D which, under the MS IAMP, does require action on the part of the city. It should be noted that the LOS for South Front Street is also at a LOS of D. Without action both of those intersections are identified to achieve a LOS of F by 2042.
4. The MS IAMP does provide that the City is to work towards two items, the first being development of the local street network both east and west of Main Street, and second to limit access at Main Street at both north and south Front Street. The first step of this is to limit those intersections to right turn only.”

The IAMP provides certain triggers that should be met before access restrictions are implemented at N. Main Street/Boardman Avenue NE. None of those triggers are referenced the facts and findings and none of those triggers are met.

There is no evidence that the intersection of N. Main Street/Front Street is “frequently the cause[s] of slowing or stopping vehicles...significantly degrade(s) the flow of traffic and reduce(s) the efficiency of the transportation system” nor that any of the IAMP adopted triggers are met. The near miss videos provided by the City do not illustrate that interactions along N. Main Street negatively affect the interchange operations.

Notably, the Findings of Fact again fail to reference the adopted IAMP triggers for modifications to the N. Main Street/Front Street intersection. Additionally, there is no evidence there are significant safety issues at N. Main Street/Boardman Avenue NE with only one reported crash from 2016-2020 with decreasing crashes between the time of the IAMP and the Technical Memorandum.

The City's LOS standard is C and while the City has concluded that the intersection operates at LOS D, the Technical Memorandum is clear that the intersections operate at LOS C under existing conditions. Nonetheless, the trigger for conversion per the IAMP is LOS E and that trigger is clearly not met.

The Technical Memorandum provides no evidence that the operations at the N. Main Street/Front Street cause

slowing or stopping of vehicles, significantly degrades the flow of traffic or reduces the efficiency of the transportation types. Regardless, none of these situations are adopted as a trigger as part of the adopted IAMP. The near miss videos provided by the City illustrate very few actual near misses.

While the City has provided no evidence that there are safety issues along N. Main Street due to access issues, we have provided the reported crash history from 2013-2022. In that timeframe, there has been one reported property damage only crash on N. Main Street between Boardman Avenue NE and Front Street per Figure 1 below. This is not indicative that there is a safety issue along N. Main Street in this street section.



Figure 1: Crashes on N. Main Street between Front Street and Boardman Avenue from 2013-2022¹

The Findings of Fact note that “At the time the MS IAMP was adopted the LOS for Main Street and North Front Street was C. Today it is D which, under the MS IAMP, does require action on the part of the city...Without action both of those intersections are identified to achieve a LOS of F by 2042.”

However, the intersection continues to operate at LOS C per the Technical Memorandum. Per the IAMP, no action is triggered until the intersection operates at LOS E. There is no action required per the IAMP.

The Findings of Fact state that the City should be working to “limit those intersections to right turn only.” However, none of the adopted triggers of the IAMP are met.

The Findings of Fact fail to conclude that the remainder of the proposed Modified Project is consistent with the IAMP, notably the restriction of the N. Main Street/Front Avenue intersection. It is clear based on the analysis above that the Modified Project is not consistent with the IAMP as the Findings of Fact ignore the adopted triggers for implementation of the access restrictions at N. Main Street/Front Avenue. There is no evidence that any of the adopted triggers have been met. The evidence illustrates that the triggers are not met. Logically, if the Modified Project is not consistent with the IAMP, then it is not consistent with the TSP. Therefore, the application cannot be approved.

The Findings of Fact state that “The City of Boardman secured the Kittelson Boardman Main Street Circulation Assessment to evaluate the various needs along Main Street and the current Level of Service (LOS) identified for the Front Streets is at D which based on the Main Street Interchange Area Management Plan (IAMP) requires action by the city once a LOS of C is reached.” As previously noted, the Technical Memorandum illustrates that

¹ <https://www.oregon.gov/odot/data/pages/crash-data-viewer.aspx>

the current level of service at N. Main Street/Boardman Avenue NE is LOS C. There is nothing in the IAMP that compels the City to take any action at LOS C or LOS D. The City continues to ignore the IAMP triggers for restricting access at N. Main Street/Front Street, which are not met.

The Findings of Fact state that "One of the primary reasons for evaluating these intersections is the conflict between pedestrians and vehicles at the Front Street intersection as well as the Boardman Avenue intersection." As already established, crashes along N. Main Street have decreased since the IAMP. The RRFB was installed after the pedestrian crash. There are no other reported pedestrian crashes. Based on the near miss videos provided by the City, there did not appear to be any near misses associated with pedestrians. None of the adopted triggers of the IAMP for restricting access are met and continue to be ignored by the City.

The Findings of Fact state "The median is defined in the MS IAMP as a solution to be implemented when certain conditions have been met, which is the case." The City recognizes that the median is a solution to be implemented when certain conditions have been met. However, the City continues to fail to recognize the conditions themselves as evidenced by the IAMP adopted triggers, which are not met. It is unclear what conditions the City is referring to as they have not recognized or analyzed the adopted triggers.

The Findings of Fact state that "The installation of the median along North Main will limit left turn movements which are identified within the near miss video to be a significant safety concern. Main Street accesses will be maintained to the three businesses, which includes the appellant's property, to allow left turns." City staff contends, possibly without engineering expertise and the necessary licensure, that a significant safety concern exists on N. Main Street. The crash history clearly provides evidence that there is not a significant safety issue along N. Main Street between Boardman Avenue NE and Front Street. The near miss video illustrates that there are very few near misses. The lack of a significant safety issue is further backed up by the fact that crashes have decreased in this street segment since the IAMP per the Technical Memorandum. The City's Exhibit 18 illustrates that a median would be installed on N. Main Street between Front Street and Boardman Avenue NE, turning the appellant's N. Main Street driveway into a right-in/right-out driveway, which directly contradicts the City's finding that Main Street access will be maintained to the three businesses, including appellant's property.

The Findings of Fact state:

"The Kittelson Main Street Circulation study shows that when Boardman Avenue and Main Street is signalized installation of a raised median on Main Street should be included from the Boardman Avenue intersection along North Main Street to terminate near the I-84 West Bound Ramp Terminal intersection which would clearly include the North Front Streets. This would result in that section of Main Street and the North Front Streets all becoming configured to be right-in/right-out only. That same study shows that the existing conditions at Main Street and NE Front Street are operating at a LOC (sic) D which, according to the Main Street IAMP, does require action."

Again, the N. Main Street/Front Street intersection does not operate at LOS D, but LOS C. The IAMP triggers for restricting access at the intersection relies on the intersection operating at LOS E.

While the Technical Memorandum does illustrate an alternative for N. Main Street that includes a traffic signal at N. Main Street/Boardman Avenue NE along with a median on N. Main Street from Boardman Avenue NE to Front Street, the Technical Memorandum does not conclude that these two improvements are somehow linked and that if a traffic signal is installed that a median must be installed. There is no analysis or statement that suggests this. The Technical Memorandum also does not overwrite the adopted triggers of the IAMP, which have been wholly ignored by the City. The Technical Memorandum's analysis is also based on a future year of 2042 with significantly different traffic volumes than current conditions. As evidenced in this report, a traffic signal is not warranted at the N. Main Street/Boardman Avenue NE intersection at this time.

Analysis of Near Miss Study

The City provided Exhibit 19, a spreadsheet with a "project name" of "Boardman Near-Miss" that includes links to videos that were collected along portions of the N. Main Street corridor. The spreadsheet summarizes observations of gaps of between 0.0 to 3.0 seconds between autos, bicycles and pedestrians.

It appears that the City collected this information with the implied intent to make the connection that short gaps between various users of the transportation system indicates that there are safety issues along N. Main Street. The City provides no engineering analysis of these videos from any qualified experts yet still concludes that there is a significant safety issue along N. Main Street. This study was performed in the absence of a significant or increasing crash history at the N. Main Street/Front Avenue intersection, at N. Main Street/Boardman Avenue NE or N. Main Street from Front Street to Boardman Avenue NE. The evidence illustrates that crashes have decreased from when the IAMP was developed per the Technical Memorandum. The Technical Memorandum illustrates that both intersections and in between operate with adequate capacity and safety. It is telling that this study was also performed without the City providing response to the objective and measurable IAMP triggers for modifying the N. Main Street/Front Avenue against which this application should be reviewed.

In the absence of any explanation or engineering analysis of the City's study, I reviewed the City's study, conducted some research and observed the videos provided. I am not aware of any Oregon authority that defines a "near miss," and the City has not attempted a definition. The City has not provided any references for the use of this methodology, provided explanation about the implications of the results or provided any thresholds to which the City may deem an intersection to have an acceptable or unacceptable level of close interactions. The City provides no engineering analysis by a qualified individual with expertise in traffic engineering. In conducting my own research, I could not find any common industry sources or research that present this methodology. The City of Boardman's traffic impact study requirements, at Boardman City Code Ch. 4.10, make no reference to this methodology or any similar methodology. The City makes no reference to previous use of such methodology. It is unclear why the City is now apparently proposing to utilize this methodology to study N. Main Street when the methodology to review access restrictions at N. Main Street/Front Street have already been established as part of the IAMP.

The City's spreadsheet notes that "In the Near Miss Summary chart, you will see links to videos showing 1.5 second, 2.0 second, and 3.0 second near miss conflicts." As noted before, the spreadsheet does not provide any references in which the utilized methodology is adopted, evaluated or explained. There are no referenced resources that differentiate the meaning of the difference in gaps observed.

Table 1 below summarizes my observations of the data at N. Main Street/Front Street.

Table 1. "Near Miss" Analysis at N. Main Street/Front Avenue

No	Date	Start Time	Gap (s)	User & Movement 1	User & Movement 2	Analysis	Near Miss?
1	09/04/24	15:36	0 to 1.5	Truck EB Through	Car NB Through	No avoidance	No
2	09/05/24	17:52	0 to 1.5	Car NB Right	Motorcycle EB Through	No avoidance	No
3	09/05/24	19:49	0 to 1.5	Car NB Left	Car SB Through	No avoidance	No
4	09/04/24	15:36	1.5 to 2	Truck EB Through	Car NB Through	Erroneously Recorded, same as number 1	No
5	09/05/24	06:46	1.5 to 2	Car NB Right	Ped WB Through	Ped crossed behind car;	No
6	09/04/24	06:43	2 to 3	Car EB Through	Car NB Through	No avoidance	No
7	09/04/24	10:40	2 to 3	Car NB Left	Truck SB Through	No avoidance	No
8	09/04/24	11:08	2 to 3	Car WB Left	Car EB Through	Minor slowing while yielding	No
9	09/04/24	11:28	2 to 3	Car WB Left	Car SB Through	No avoidance	No
10	09/04/24	12:43	2 to 3	Car WB Left	Car NB Through	No avoidance	No
11	09/04/24	14:18	2 to 3	Car NB Left	Car SB Through	Possible minor slowing	No
12	09/04/24	14:45	2 to 3	Car EB Left	Car SB Through	No avoidance	No
13	09/04/24	14:50	2 to 3	Car WB Through	Car NB Through	No avoidance	No
14	09/04/24	15:28	2 to 3	Car WB Left	Car NB Through	No avoidance	No
15	09/04/24	15:41	2 to 3	Car WB Left	Car NB Left	No avoidance	No
16	09/04/24	16:19	2 to 3	Car WB Left	Car NB Through	No avoidance	No
17	09/04/24	16:24	2 to 3	Car WB Left	Car NB Through	No avoidance	No
18	09/04/24	16:40	2 to 3	Car WB Left	Car NB Through	No avoidance	No
19	09/04/24	16:50	2 to 3	Car WB Left	Car NB Through	No avoidance	No
20	09/04/24	16:56	2 to 3	Car EB Left	Car SB Through	SB Vehicle turned from Chevron d/w and may not have accelerated as fast due to EB vehicle	No
21	09/04/24	17:43	2 to 3	Car NB Through	Scooter EB Through	Scooter crossed behind car; No avoidance	No
22	09/04/24	17:53	2 to 3	Car WB Left	Car NB Through	No avoidance	No
23		17:53	2 to 3	Car NB Left	Bike NB Through	Bike crossed in crosswalk behind car	No
24	09/04/24	18:02	2 to 3	Car NB Left	Car SB Through	No avoidance	No
25	09/05/24	06:38	2 to 3	Car WB Through	Car NB Through	No avoidance	No
26	09/05/24	07:14	2 to 3	Car WB Left	Car NB Through	No avoidance	No
27	09/05/24	09:30	2 to 3	Car EB Through	Car SB Through	No avoidance	No
28	09/05/24	11:13	2 to 3	Car EB Left	Car SB Through	Possible minor slowing	No
29	09/05/24	11:33	2 to 3	Car WB Left	Car NB Through	No avoidance	No
30	09/05/24	11:55	2 to 3	Car WB Left	Car NB Through	WB vehicle turned from Chevron d/w; NB vehicle slowed	Yes
31	09/05/24	11:55	2 to 3	Car WB Left	Car NB Through	No avoidance	No
32	09/05/24	12:06	2 to 3	Car NB Left	Car SB Through	No avoidance	No
33	09/05/24	12:06	2 to 3	Car NB Left	Car SB Through	No avoidance	No
34	09/05/24	12:19	2 to 3	Car EB Left	Car SB Through	No avoidance	No
35	09/05/24	13:09	2 to 3	Car WB Left	Car/Trailer NB Through	Possible minor slowing	No
36	09/05/24	15:08	2 to 3	Motorcycle NB Left	Bus SB Through	No avoidance	No
37	09/05/24	15:19	2 to 3	Ped SB Through	Car WB Left	Car turned behind ped; No avoidance	No
38	09/05/24	15:29	2 to 3	Car NB Left	Car SB Through	No avoidance	No
39	09/05/24	15:59	2 to 3	Car WB Left	Car NB Through	No avoidance	No
40	09/05/24	16:11	2 to 3	Car WB Left	Car NB Through	No avoidance	No
41	09/05/24	16:31	2 to 3	Car EB Through	Car NB Through	No avoidance	No
42	09/05/24	16:38	2 to 3	Car NB Through	Ped WB Through	Ped crossed behind car; No avoidance	No
43	09/05/24	16:41	2 to 3	Car WB Left	Car NB Left	No avoidance	No
44	09/05/24	16:41	2 to 3	Car WB Left	Car NB Through	No avoidance	No
45	09/05/24	16:54	2 to 3	Car WB Left	Car NB Through	WB vehicle turned from Chevron d/w; NB vehicle slowed	Yes
46	09/05/24	17:22	2 to 3	Car NB Left	Car SB Through	Possible minor slowing	No
47	09/05/24	17:25	2 to 3	Car WB Left	Car NB Through	No avoidance	No
48	09/05/24	17:26	2 to 3	Car WB Left	Car NB Through	No avoidance	No
49	09/05/24	18:11	2 to 3	Car NB Left	Car SB Through	No avoidance	No
50	09/05/24	18:36	2 to 3	Car EB Through	Car NB Through	No avoidance	No
51	09/05/24	18:44	2 to 3	Car WB Left	Car NB Through	No avoidance	No
52	09/05/24	19:23	2 to 3	Car NB Left	Car SB Through	No avoidance	No
53	09/05/24	19:48	2 to 3	Car WB Left	Car NB Through	No avoidance	No
54	09/07/24	07:23	2 to 3	Car EB Left	Car SB Through	Possible minor slowing	No
55	09/07/24	10:03	2 to 3	Car WB Left	Car NB Through	No avoidance	No
56	09/07/24	11:07	2 to 3	Car WB Left	Car NB Through	No avoidance	No
57	09/07/24	12:45	2 to 3	Car WB Left	Car NB Left	Possible minor slowing	No
58	09/07/24	13:02	2 to 3	Car EB Left	Car SB Through	No avoidance	No
59	09/07/24	13:56	2 to 3	Car/Trailer WB Left	Car NB Through	Possible minor slowing	No
60	09/07/24	15:27	2 to 3	Car NB Left	Car SB Through	No avoidance	No

Even if the City were to consider these videos and charts without any context or definitions, my view would be that a near miss could be described as a vehicle suddenly stopping, slowing or swerving to avoid a crash. Out of the 28 hours of data collected at the N. Main Street/Front Avenue intersection, I only observed two interactions in the videos provided, that I would arguably classify as near misses, where one of the participants had to suddenly stop, slow or swerve to avoid a crash. Both of those interactions occurred at N. Main Street/Chevron driveway. The average daily traffic on N. Main Street near Boardman Avenue appears to be approximately 7000 vehicles per day per the Technical Memorandum, which results in thousands of interactions between various travel modes per day. The overwhelming majority of the video data shows normal interactions and movements between multiple modes of transportation on N. Main Street that have been safely completed. The crash history of N. Main Street between Boardman Avenue NE and Front Street further illustrates that there are very few crashes that have occurred and the recent crash history has actually decreased since the IAMP per the Technical Memorandum in this street segment.

I also reviewed the N. Main Street/Business driveway videos. Of the 28 hours of data collected in this section, I observed no interactions that I would classify as near misses.

The City's videos very effectively illustrate that there are very few actual near misses at the N. Main Street/Front Street intersection nor along N. Main Street between Boardman Avenue NE and Front Street. As evidenced by the decreasing crashes at the N. Main Street/Front Street intersection, there is no evidence that this intersection should be restricted for safety reasons and certainly not according to the adopted criteria of the IAMP.

Ultimately, the study performed by the City is irrelevant, as the City has adopted criteria under which restrictions to the N. Main Street/Front Avenue intersection modifications are to be reviewed and these videos do not meet the criteria. The City has failed to provide evidence that the objective and measurable criteria of the IAMP is met. I have provided substantial evidence that the criteria is not met.

Queues Between N. Main Street/Boardman Avenue NE Intersection and N. Main Street/I-84 Offramp

The City has claimed that the RRFB causes significant backups toward the I-84 ramp intersections although staff has never provided quantifiable evidence of these backups. The City has never provided queue estimates under the existing operations with the RRFB. There is approximately 375 feet between the N. Main Street/Boardman Avenue NE and N. Main Street/I-84 WB offramp intersections. The near miss videos provide some evidence of the pedestrian interactions with vehicles. Those videos illustrates occasional groups of pedestrians crossing N. Main Street but those videos do not illustrate anything that remotely resembles queues that would extend to the I-84 ramps, but very short queues that are hundreds of feet short of interacting with the I-84 ramps.

The City provided a traffic analysis for the intersection of N. Main Street/Boardman Avenue NE, but it is based on the number of pedestrians that the City counted as part of their Technical Memorandum and not on the scenario where far more pedestrians are served. The proposed traffic signal will introduce significant, regular delay as it serves all the phases of the traffic signal including for every single pedestrian and vehicle crossing N. Main Street. It will introduce queues to N. Main Street that are not currently present as eastbound and westbound traffic from Boardman Avenue NE is served while northbound and southbound traffic is stopped. The traffic signal analysis fails to consider the scenario when the traffic signal is regularly served by heavy pedestrian demand. There is no evidence that indicates that a traffic signal will not introduce similar or even worse queues than the RRFB.

Boardman Police Department Letter

The City of Boardman Chief of Police provided a letter dated October 22, 2024. It is important to note that the police chief's letter addresses only the intersection of "Boardman Ave and Main Street" and makes no comment regarding the N. Main Street/Front Avenue intersection or points in between the two intersections.

The police chief astutely recommends a "comprehensive traffic study to identify the root causes of the safety issues and developed targeted solutions." There is no evidence that any engineering study has been performed that supports the City's proposed improvements at the intersection. This is a significant fault in the analysis as the City now proposes a traffic signal that is not warranted based on data from their own Technical Memorandum.

Conclusion

A traffic signal is not currently warranted at the N. Main Street/Boardman Avenue NE intersection based on the traffic data presented in the City's Technical Memorandum. The City has failed to conduct an engineering study of the intersection based on the MUTCD's traffic signal warrants, which the City is required to comply with.

There is no evidence that there are significant safety issues at N. Main Street/Boardman Avenue NE, N. Main Street/Front Street or along N. Main Street between those intersections with reported crashes decreasing from the IAMP to the Technical Memorandum. Both the intersections currently operate adequately per City standards. The near miss study establishes that there are very few near misses. The City has failed to make any connection between near misses and crashes, but based on the evidence, the intersections and in between operate adequately.

It is clear based on the analysis above that the Project is not consistent with the IAMP as the Findings of Fact ignores the adopted triggers for implementation of the access restrictions at N. Main Street/Front Avenue. There is no evidence that any of the adopted triggers have been met.

Therefore, the application cannot be approved.

Should you have any questions, feel free to contact me at rick@greenlightengineering.com or 503-317-4559.

Sincerely,

Rick Nys, P.E.
Principal Traffic Engineer



RENEWS: 12/31/2024