DE18-02

City of Grand Junction
Public Works Department
250 North 5th Street
Grand Junction, CO 81501-2668
Phone: (970) 244-1555
FAX: (970) 256-4022

July 22, 2002

Mr. Trevor Brown
Rolland Engineering
405 Ridge Blvd.
Grand Junction, CO 81503

RE: TEDS Exception to Allow Symmetrical Reverse Curve Transitions for Right Turn Deceleration Lanes

Dear Trevor;

Please find attached the committee's decision on the above request. You may use this decision to proceed through the development review process.

If you have any question concerning this decision, please feel free to contact the Development Engineer in charge of your project or me.

Sincerely,

Michael G. McDill, P.E.
City Engineer

C: Rick Dorris, Development Engineer (256-4034)

\DE#18 02-12&Pat.07-22

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DESIGN EXCEPTION #DE18-02

To: Mark Relph, Director of Public Works & Utilities

Thru: Tim Moore, Public Works Manager

Copy to: Rick Dorris, Development Engineer

From: Mike McDill, City Engineer

Date: June 27, 2002

RE: Exception to Allow Symmetrical Reverse Curve Transitions for Right Turn Deceleration Lanes

DESCRIPTION OF THE SITUATION

Applicant is planning to construct a new City Market grocery store at the southeast corner of 12th and Patterson. The size of the lot and other physical constraints do not allow for the minimum tapers required in TEDS. Applicant points out that left turn bays are allowed to have symmetrical reverse curves instead of tapers and that these reverse curve result in considerable shorter transition lengths. Applicant request permission to use these same reverse curve standards for the right turn bays on both 12th Street and Patterson Road.

Applicant requests an exception to Section 6.2.5.3, *Left and Right Turn Lane Design*, which requires minimum tapers for right turn lanes without any option for symmetrical reverse curves, as there is for left turn bays.

In fact, the applicant suggests that we review this area of our TEDS and consider adjusting the standard to allow this option everywhere.

EXCEPTION CONSIDERATIONS

1. **Will the exception compromise safety?**
   The shorter transition might result in more rear-end accidents due to entering vehicles not slowing down fast enough. However, the potential for these accidents to occur or to be severe should be mitigated by the fact that entry speeds are fairly slow (35 to 40 mph) compared to normal highway design standards (55m to 70 mph).

2. **Have other alternatives been considered that would meet the standard?**
   The applicant has considered the other available options for locating both driveways and all other options seem to create other conflicts with access spacing. There does not appear to be any alternative ways to maintain either access that more closely complies with TEDS. This is largely due to the fact that they have a relatively small site at a major intersection.

3. **Has the proposed design been used in other areas?**
   The symmetrical reverse curves are routinely used for left turn bay designs.

4. **Will the exception require CDOT or FHWA coordination?**
   No.

5. **Is this a one-time exception or a manual revision?**
   This would be a one-time exception for this project.

Staff Recommendation

I recommend approval of the necessary Design Exceptions to Section 6.2.5.3 to allow symmetrical reverse curves for the two right turn deceleration lanes at the above location due to physical restraint of the particular site. Before we change the standard, staff would like to do more research into the ramifications of this curved transition versus the normal taper.

Recommended by: _____

Approved as Requested: _____

Approved as Recommended: ✓

Denied: _____

_____

_____

_____

\DE18 02-12&Pat06-27

PROPOSED EXCEPTION TO CITY OF GRAND JUNCTION TEDS

Submittal for CITY MARKET at 12th and Patterson
City File #RZ-2002-118
Prepared By: Trevor Brown, ROLLAND Engineering
Date: June 5, 2002 Revised June 25, 2002

Proposed Exception

The proposed design exception request is the length of the right-turn deceleration taper and storage lane on 12th Street into the site. The proposed design illustrates a combined taper and storage length 5 feet less than cited for in TEDS. The Traffic Report uses entry 'C' to denote this entrance.

Alternatives Considered and Impacts

The decel lane as designed has an approximate 60 foot long taper with a storage length of approximately 105 feet. TEDS Section 6.2.5.3 Left and Right Turn Lane Design, identifies a right-turn taper length ratio of 10:1 for a design speed of 35 MPH. Calculating with such ratio the taper should be 120 feet in length. Storage length design is taken from a table that is based on the number of turning vehicle movements. The Traffic Report shows year 2020 having 31 right turn movements per hour, which requires a storage length of 50 feet. TEDS calls for a total design length of 170 feet. The total length of the designed decel lane is 165 feet, a variation of 5 feet from TEDS. The design length is constrained by the property boundary of Arrowhead Realty on the south and by the distance of this site access point from Patterson Road to the north.

In order to design the decel lane with a storage length of 170 feet, consideration was given to moving the 12th Street entrance to both the north and to the south. The alignment of the 12th Street access point to the site was designed as such for two reasons: 1) to reduce interference between traffic movements of the City Market site and the Village Fair traffic movements at the Village Fair Shopping Center entrance on the west side of 12th Street; and 2) the distance of separation between Patterson Road and the 12th Street access point provides greater maneuverability to vehicles exiting the site to enter the northbound left lanes on 12th Street.

To provide additional taper length to the south, City Market contacted Arrowhead Realty to discuss the purchase of the Arrowhead Realty parcel. City Market and Arrowhead Realty were not able to come to terms regarding purchase price.

Applicant offers that other than granting an exception to TEDS that consideration be given to amending Section 6.2.5.3 of TEDS. Page 12 of Section 6.2.5.3 of the TEDS has a reverse curve allowance for left hand turn lanes that allows for a 60 foot reverse curve for design speeds of 35 MPH. Consideration of an allowance for a 60-foot reverse curve

for a right hand turn lane, the same reverse curve allowed for a left turn lane, would result in a design of a total of 110 feet in overall right-turn lane length. This length of turn lane would fit within the constraints imposed by the northern boundary of the Arrowhead Realty parcel, Patterson Road alignment, and the City Market internal site circulation. Accordingly a request is made that the TEDS be amended within 6.2.5 *Lane Requirements* to allow symmetrical reverse curves for right turn lane approaches the same as allowed for left turn approaches in TEDS 6.2.5.3 *Left and Right Turn Lane Design*. This amendment would allow right turn lanes to be designed in the more confined areas of the City where there are numerous site constraints due to existing improvements.

The 12th Street plan and profile can be redesigned and submitted to the City showing conformance to an amended TEDS allowing a symmetrical reverse curve into the right turn storage lane.

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From: "ROLLAND Engineering" <rolleng@attbi.com>
To: <mikemcd@ci.grandjct.co.us>
Date: 6/25/02 10:01AM
Subject: City Market at 12th and Patterson

Mike,
Here are the requests for TEDS exceptions related to City Market. We are requesting that TEDS be amended to allow for symmetrical reverse curves for deceleration lanes at the 12th Street entrance and at main entrance from Patterson Road. Wellington Avenue will not require a TEDS exception. After talking with Jody Kliska the design for Wellington Avenue will be revised to meet all of the City's requirements. I have sent a copy of this to Pat Cecil for his records.

Thank You,
Trevor Brown

CC: "Mike Shunk" <mshunk@kingsoopers.com>, "Michael D. Foley" <mfoley@goldbergprop.com>, "Pat Cecil" <patc@ci.grandjct.co.us>

From: Jody Kliska
To: Mike McDill
Date: 6/26/02 4:47PM
Subject: TEDS Exceptions

1. St. Mary's parking garage exception - The exception request lists 26 parking garage locations where the proposed parking module sizes have been used successfully, as well as noting other national standards. I can see granting this request. My assumption is that the St. Mary's parking garage is not intended for high turnover of vehicles.

With regard to your question about changing the TEDS standards for surface lots, I think we should do more research as well as some field trips. Walmart recently changed their parking to 90 degree from the angled parking. Assuming that it meets our current standards, it feels tight to me. I think my comfort level as a driver would feel threatened by the combination of narrower spaces and less aisle width in that location. According to the ITE Traffic Engineering Handbook, much of the alleged difficulty with 90 degree parking stems from inadequate aisel dimensions.

2. City Market deceleration tapers - I suggested to Trevor that he take this approach and use the reverse curves in place of the straight tapers. We have used the reverse curves in other locations and the relatively low speeds on the two streets lend themselves to using the reverse curves.
We should probably look into revising the TEDS to allow this in future applications. I have added it to my list of items to review in TEDS.