



TECHNICAL MEMORANDUM

TO: Jerry Postema
Environmental Services Manager
City of Goodyear

FROM: Brian Hamrick, P.E.
Senior Project Manager
Liberty Utilities

DATE: December 6, 2012

RE: MAG 208 Amendment – Verification of Sewer Capacity

Carollo Engineers has been hired by Liberty Utilities to update the existing water and sewer master plan for the Litchfield Park Service Company (LPSCO). The areas included in the current MAG 208 Amendment; in the northeast corner of the existing LPSCO sewer collection system, were included in the sewer modeling that was performed as part of this master plan project. The results of the recently completed modeling are shown in three figures (Figure 4.3, Figure 4.4, and Figure 4.5), which are attached to this document. These figures show that we have adequate sewer capacity during peak flow conditions in the existing lines to service the additional service areas identified in the MAG 208 Amendment. A summary of the figures is below.

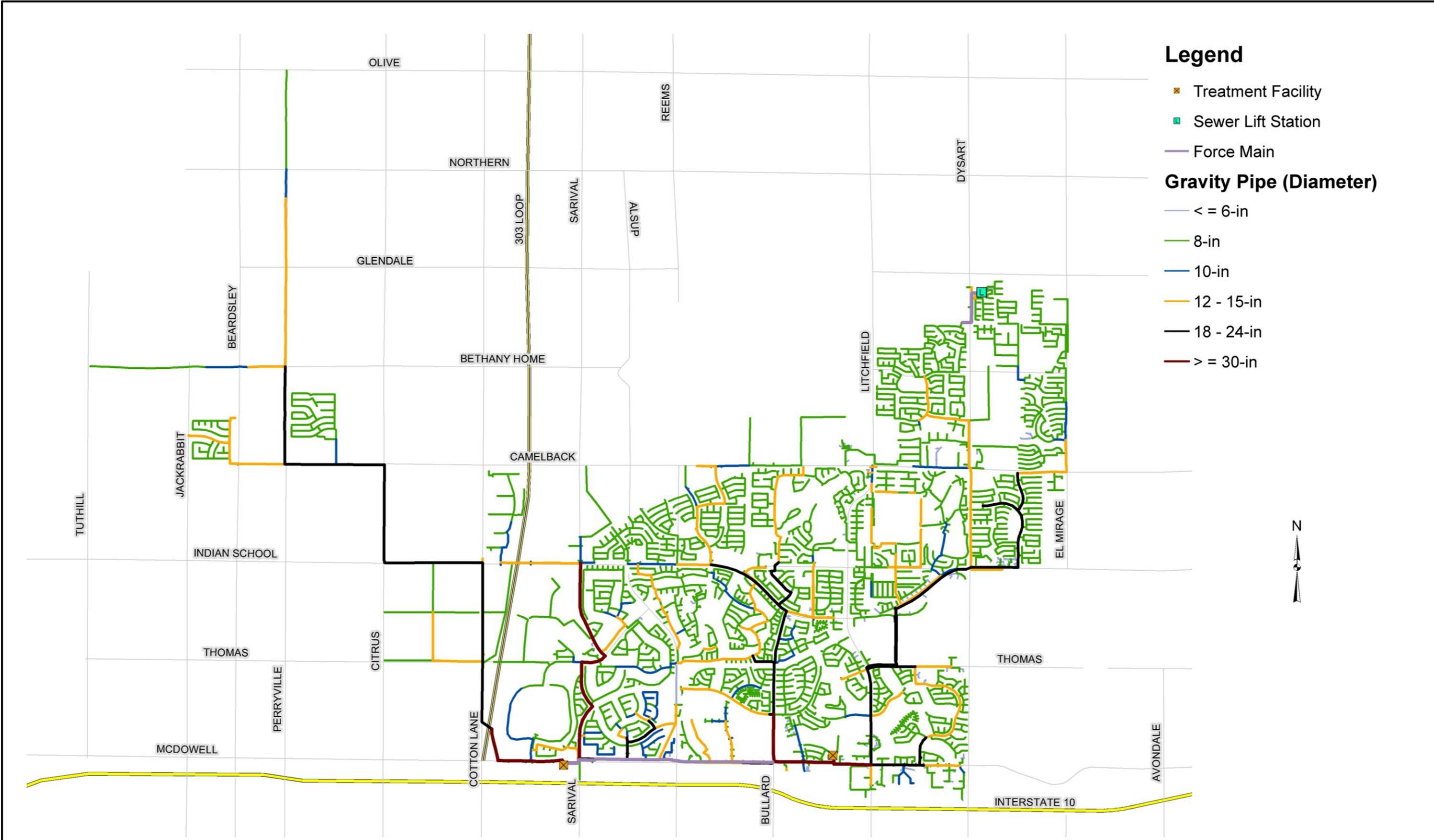
Figure 4.3 shows the collection system at buildout that was modeled. This model includes the areas from the MAG 208 Amendment. Refer to the MAG 208 Amendment for the areas in question.

Figure 4.4 shows the collection system that was modeled by phases at peak flow conditions. We modeled two phases, existing and buildout. The model of the existing phase is a sewer model of the existing sewer mains at the current peak flow conditions. A model at buildout is a model that incorporates all of the existing developments, the known future developments, and the remainder of the unserved areas within our sewer service territory. The areas included in the MAG 208 Amendment are modeled in the buildout scenario. This figure shows that no upgrades to existing sewer mains are required to handle the additional flows from the MAG 208 Amendment areas.

Figure 4.5 verifies that all existing sewer mains between the MAG 208 Amendment area and the plant have sufficient capacity during peak flow conditions. These sewer mains have a d/D (flow depth/pipe diameter) of less than 0.75. A d/D of 0.75 is approximately 75% of the pipe capacity at full flow.

These three figures show that the LPSCO collection system has sufficient pipe capacity in the existing sewer mains to handle the additional sewer flows during peak flow conditions from the added service areas that are included in the MAG 208 amendment.

Encl: Figure 4.3 – Collection System at Buildout
Figure 4.4 – Collection System by Phase
Figure 4.5 – Collection System Buildout Capacity

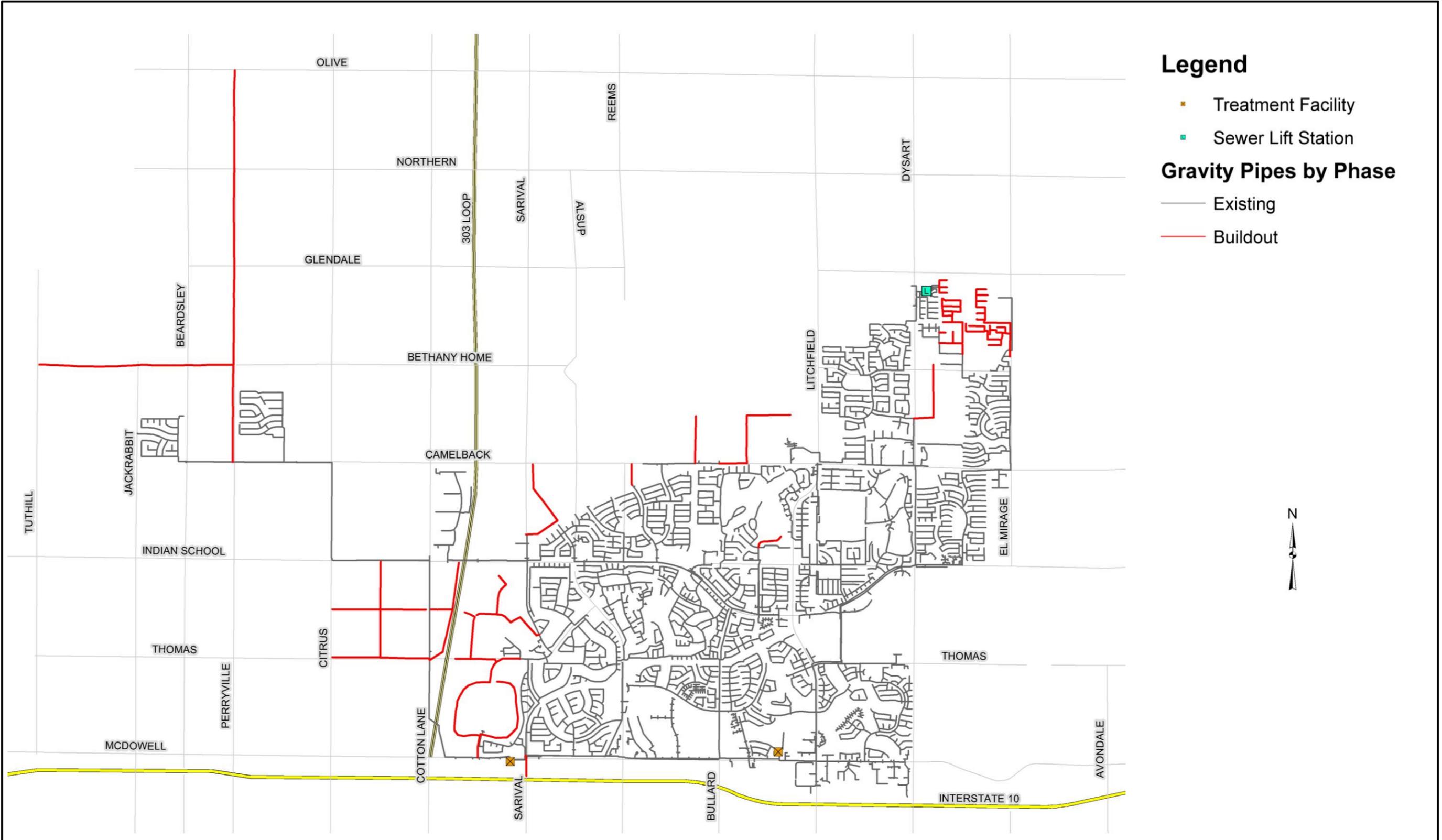


COLLECTION SYSTEM AT BUILDOUT

FIGURE 4.3

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 INTEGRATED WATER AND SEWER MASTER PLAN UPDATE



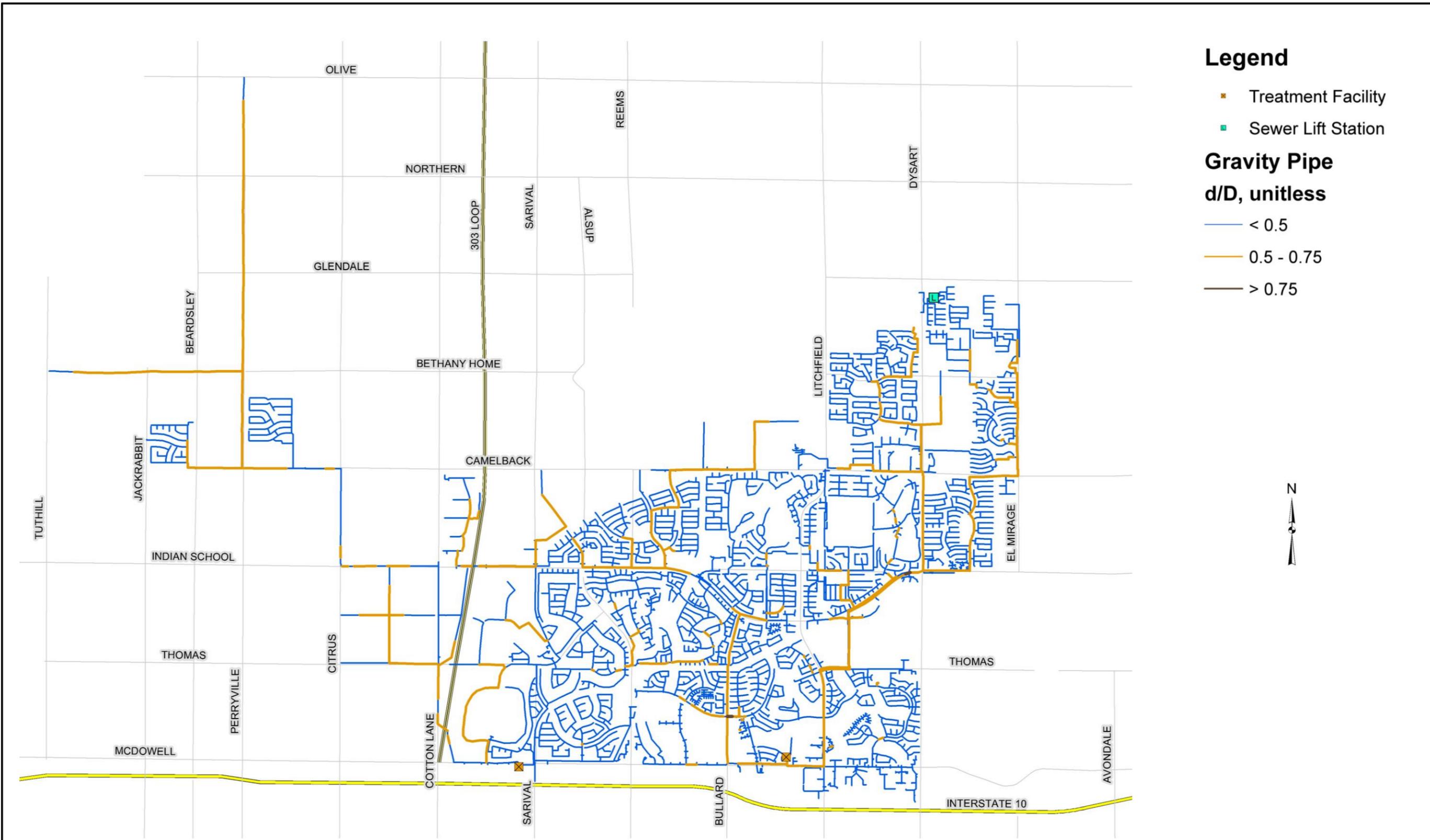


COLLECTION SYSTEM BY PHASE

FIGURE 4.4

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- Legend**
- Treatment Facility
 - Sewer Lift Station
- Gravity Pipe**
d/D, unitless
- < 0.5
 - 0.5 - 0.75
 - > 0.75

COLLECTION SYSTEM BUILDOUT CAPACITY

FIGURE 4.5

LIBERTY UTILITIES, INC.
INTEGRATED WATER AND SEWER MASTER PLAN UPDATE

