# Kirksville Concrete Streets Briefing

- **During the most recent Municipal Code update the Code was changed regarding concrete and asphalt streets. The follow briefing will provide data and evidence to support those changes. This briefing was provide to Kirksville concrete providers, the American Concrete Paving Associations, contractors, developers, senior staff, and two city council members. Although multiple reasons and assumptions were provided, all agreed that the current state of concrete residential streets in Kirksville is unacceptable.**

- **The following slides provide information concerning the new Code language, concrete streets, funding shortages, responses to statements made during the 17 August 2020 City Council meeting, current photo evidence of Kirksville concrete street conditions, and recommendations from city staff.**

## City Code of Ordinance, Sec. 32-37. Concrete streets when permitted.

Concrete streets are not allowed unless just cause is provided by the owner, contractor, or developer and approved by the city engineer and public works director. Cost will not be considered as a just cause. If concrete is approved, new local residential streets shall be at least six inches of MoDOT B1 or B2 design, 4,000 psi (see MoDOT section 501 for specifications). Curb will be built using the same MoDOT B1 or B2 design, 4,000 psi concrete. Compacted subgrade for all pavement types and curb shall be six inches minimum and 95 percent of the standard maximum density. It is the responsibility of the builder to provide concrete cylinder strength testing from a certified lab. Random load selected by the city engineer for cylinder test will be conducted at least twice daily. Failure to meet the 4,000 psi strength will result in the city not accepting the street into its inventory. Soil test results of the areas to be paved will be provided to the city engineer prior to construction. The common soil test for road construction includes classification of soil, particle size distribution, moisture content determination, specific gravity, liquid limit and plastic limit tests. Moisture content, particle size and specific gravity tests on soils are used for the calculation of soil properties such as degree of saturation. Based on the test results, soil stabilization may be required. Soil stabilization, if required, will be accomplished using lime or cement. A stormwater plan and specification must be included in the street engineering design/plan including profiles, elevations, curb, drainage, stormwater plan, etc., must be submitted to and approved by the city engineer and public works director prior to construction. All soil, density, mix design, and strength testing is the responsibility of the owner, contractor, and/or developer. Failure to build the street in accordance with the above standards, procedures, and city/MoDOT specifications or to provide required testing information/results required by the city from a certified lab will result in the city not accepting the street into its inventory. All work will be warranted by the contractor for two years from the day of acceptance by the city.

- **According to the Federal Highway Administration, the average life of a concrete road is about 40 years, but that can be much lower in a place where freezing and thawing wreak havoc on the structure. Deficient design and/or construction can also significantly reduce serviceability. The American Concrete Paving Association has stated that the City should get 25 years of life on residential concrete streets with little or no maintenance.**

- **Whether it is due to mix design, poor construction habits, quality control, street design, insufficient subbase preparation, climate, etc., many concrete streets built by contractors/developers are not even lasting 5 years without significant issues.**

- **The taxpayer should not be burdened with accepting these streets into the city inventory only to spend $500,000 annually to repair an average of only ¾ miles of concrete slabs in an attempt to just keep them drivable. Based on a 24 foot wide street, the cost to tear out, reestablishing the base, and monolithic curb exceeds $1.1 million per mile. This assumes that no subbase soil stabilization, additional curb, or drainage work is required.**

- **If contractors and developers want the tax payer to accept financial and maintenance responsibility for their streets for perpetuity (forever), then contractors and developers have to build streets the way the taxpayer wants them built. This is not unreasonable.**

- **The city can update the code to allow contractors and developers to build concrete streets, but these streets should not be accepted into the city's street inventory. The streets must be built to code but will remain private. This means that the taxpayer will assume no responsibility for any future maintenance, repair, or replacement.**

- **Based on internal assessments and an outside unbiased study, the minimum street rehabilitation budget is still underfunded by more than $1 million dollars annually. This is due to the cost for reconstruction and maintenance of current concrete streets. The City does not bring in enough tax revenue to address the funding shortages. Adding more concrete streets to the inventory will only exacerbate this problem.**

- **Response to comments from August 17, 2020 council meeting:**

**Kirksville Concrete Provider:**

**“*No competition will likely increase cost*”**

**Answer: There is limited or no competition for concrete in Kirksville now. Asphalt and concrete are competitively and openly bid annually by the city. The city receives multiple bids from various asphalt venders.**

**“ *As stewards of the city of taxpayers and citizens you would think you would encourage open bidding for higher quality and competitive pricing*”**

**Answer: The city is required to competitively and openly bid any public works project over $25,000 and pay prevailing wage on projects exceeding $75,000. Contractors and developers do not have these requirements. The best long term use of taxpayer dollars is the deciding factor for this code change.**

## American Concrete Pavement Association:

“***We (Missouri) are a very non-conducive geological state to roadway pavements, meaning our dirt is great for growing crops, it is not great for roads”***

Answer: The city 100% agrees, yet little or no soil stabilization has ever been done by contractors.

“***Because we have wet seasons and because instable soil would require quite of bit of money and investment to bring them up to a level to something strong enough to hold flexible pavement, we do a lot of concrete”***

Answer: This gives the illusion that subbase stabilization is not needed for concrete. This is far from the truth. The lack of subbase stabilization may be one of the biggest reasons for the substantial and continual failure of concrete streets in Kirksville.

## American Concrete Pavement Association:

**“*especially where we do stop and go. As we go down our residential streets were the dump truck stops, people are turning in and out”***

Answer: The City uses concrete at intersection because of this issue. How many dump trucks are running on residential streets? We have experienced no issues with residents turning in/out of homes on asphalt roads. If this were true many sections Baltimore Street would show this type of damage.

**“*as you drive the interstate system your going to see what looks like a lot of asphalt pavement performing really really well, they are on the original concrete pavement so MoDOT has maintained those with 3 inches, 4 inches of asphalt for an extra 20-30 years”***

Answer: the specification on these type roads are normally 6” of base, 6 “ of concrete, and 4” of asphalt. The city will absolutely allow this kind of residential street to be built and can write this into the code.

Note: Drainage is an issue with overlaying residential concrete streets with asphalt due to role over curb.

## American Concrete Pavement Association:

**“ *if you go straight on 4 inches of rock, 6 inches of rock that rock clogs up and all of a sudden you have situations where our subdivision don’t drain well, they don’t have exit places for the water to go like our highways and that is the death to asphalt when you have a wet base with flexible material over it”***

**Answer: Again, this gives the illusion that you can place concrete on a unstable or wet base/subbase, with little or no preparation or stabilization. It also shows that the ACMA knows that the soil is unstable and clay is pumping through the rock, meaning some type of stabilization is required. Residential streets are normally drained by using curb and gutter. Highway drainage and residential street drainage characteristics are not comparable. All pavements must have a stabilized subbase and proper drainage. The base/subbase is the foundation of any street. Concrete is not an exception. Little or no subbase soil stabilization has ever be done on contractor built residential streets in Kirksville.**

**Analysis of the Federal Highway Administration's (FHWA's) Long-Term Pavement Performance (LTPP) data reveals that a pavement's foundation (base or subbase and subgrade) is one of the most critical design factors in achieving excellent performance for any type of pavement.* For concrete pavements, the design and construction requirements of a roadbed or foundation structure may vary considerably, depending upon subgrade soil type, environmental conditions, and the amount of anticipated heavy traffic.**

**Expansive clay soils (also known as heavy clay or fat clay soil) are soft-textured soils containing minerals that undergo considerable volumetric changes during seasonal moisture fluctuations. They absorb water and expand (swell), as much as ten percent or more when wet, and crack (shrink) when dry. In addition, the water content in expansive clay soils can freeze, compounding the swelling problem with frost heave issues.**

**The compaction test report completed by Benton & Associates for Sunset Cove Drive (built lass than 7 years ago) prior to construction shows soil material as "Fat Clay (CH), Yellow Brown mottled Gray,  Trace Sand, Moist", Moisture 21.8%, yet no geotechnical engineering or testing was done to determine is soil stabilization was needed.**

**Sunset Cove Drive (recent photos below) is less than 7 years old. The street has already had 13 saw repairs, slab replacement, holds water, and shows considerable failures. Public Works has been vocal about not accepting this street.  If the city had accepted this street the taxpayer would have paid for all previous repairs and would be responsible for future repairs and maintenance.**

## Local Contractor/Developer:

***“ the number one reason you guys built an asphalt factory was because we cannot get asphalt. If the city can’t get asphalt how is us contractors supposed to get asphalt? We have a concrete company, I mean, we buy concrete, we use concrete, and everything else. Is the city going to sell asphalt to us or not? You know I mean because we can’t get asphalt in Kirksville. So yes, we do need to have the choice between concrete and asphalt ”.***

**Answer: this is somewhat misleading. The asphalt plant was built in late 2016 so the city could produce asphalt when needed, not be bound to contractor timelines, control mix designs, and cut cost. The city has bid and contracted for asphalt paving for over 20 years, and still does. The plan to combine contractor and inhouse work has resulted in more annual miles paved , for two consecutive years, than has been done in a single year in over 20 years. The asphalt plant is a tool in the tool box and it is working as planned. Contractors can hire this work done just like the city and local boring crews have done. The city has been reluctant to compete with local/regional vendors, to include concrete, by selling asphalt. If asphalt contractors (Millers, Capital, Emery Sapp, Trenton, etc.) have been contacted and developers cannot find someone to pave or provide asphalt then maybe the city can help.**

**Another important issue that needs to be addressed: Developers build streets to hold residential traffic, the city accepts the streets, and then developers continue to build homes on the streets for 20+ years. Contractors are driving excavators weighing in excess of 45,000 pounds with steel tracks, trucks haukling concrete, brick, rock, etc. on these streets and over curbs. This is causing excessive damage to the streets. The developers and contractors make no effort to preserve the streets. The contractors and developers continue to profit why saddling the taxpayer with unaffordable and unfunded street repairs. There need to be a discussion about when to accept these streets and who pays for street rehabilitation while construction is still underway.**

**It is understandable that each entity must advocate for their cause. As concrete associations, producers, and contractors advocate for their product, city staff must advocate for what they feel is best for the taxpayer.**

**Lets put everything aside, all discussions, agreements, disagreements, reasons, etc. It is important to look at reality as it relates to concrete streets. You need to actually see what the City is facing currently in real time.**

**The following slides are photos taken in within the last 2 weeks of several different neighborhoods in Kirksville with concrete streets. None are over 21 years old from final completion, most are under 20 years old. According to the concrete advocates these streets should last 25 years with little of no damage or repairs.**

1993,1996,1999

# Lakeside Estates


# Lakeside Estates

# Lakeside Estates

2000

# Maple Street


# Maple Street

2001

# The Villages


# The Villages

# The Villages

# The Villages

1998, 2000

# South Pointe


# South Pointe

# South Pointe

2004

# Weatherstone Drive


# Weatherstone Drive


# Weatherstone Drive

2004

# Weatherbrooke Drive


# Weatherbrooke Drive

# Weatherbrooke Drive

2004

# Breezewood Drive



# Breezewood Drive

# Breezewood Drive

# Sunset Cove (7 years old)

2013


# Sunset Cove (7 years old)

# Sunset Cove (7 years old)

2001

# Meadow View Drive

# Meadow View Drive

# Meadow View Drive

**THE FOLLOWING ARE EXAMPLES OF CONTRACTOR BUILT NEIGHBORHOODS THAT ARE OVER 21 YEARS OLD.**

**The City has spent millions of dollars in the past few years just trying to keep these streets drivable. Even with the money spent these neighborhoods still have significant concrete failures.**

# Kings Ridge Area


# Kings Ridge Area

# Kings Ridge Area

# Kings Ridge Area

# Kings Ridge Area

# Kings Ridge Area

# Country Club Drive

# Country Club Drive

# Country Club Drive

# New Street, Dogwood Street, Fairview Street Areas


# New Street, Dogwood Street, Fairview Street Areas

# New Street, Dogwood Street, Fairview Street Areas

# New Street, Dogwood Street, Fairview Street Areas

# New Street, Dogwood Street, Fairview Street Areas

# New Street, Dogwood Street, Fairview Street Areas

# New Street, Dogwood Street, Fairview Street Areas

# New Street, Dogwood Street, Fairview Street Areas

# New Street, Dogwood Street, Fairview Street Areas

# Bobwhite Street


# Bobwhite Street

# Mobile Home/Trailer Park

# Mobile Home/Trailer Park

# Mobile Home/Trailer Park

# City Code, Sec. 12-19. Issuance procedure generally.

**(f) *Contractor testing.* Construction contractors, electricians, and plumbers are required to pass a written test showing competency in the field in which a business license is being applied for. The passing of the written test is necessary for final approval of a business license for these occupations.**

**(1) Tests will be scheduled and administered by the codes department.**

**(2) Tests will be graded on a pass/fail basis. Seventy percent is the minimum passing grade for any test.**

**(3) Persons who fail the first test will be allowed to take a second test at any time. Persons who fail a test the second time will be required to wait two weeks before taking a test again.**

Effective 2015

# Previous City Code, **Sec. 21-27. - New *streets*.**

Prior to beginning any work on *street* subgrade the contractor shall secure the services of a qualified independent testing agency to acquire samples of the material to be used for subgrade construction. These samples shall be analyzed to determine proctor values, liquid limits, and plasticity index. Copies of the analysis shall be provided to the city engineer for review prior to commencing any subgrade preparations. If it is determined that fly ash modification is required, the following guidelines shall be followed:

(1) The contractors independent testing agency shall determine the areas to be modified, the amount of fly ash to be used (percent by weight), and depth to be tilled.

(2) Construction of pavements on high plasticity soils shall be modified with Class "C" fly ash, or replaced with lower plasticity soils. High plasticity soils shall be defined as soils with a liquid limit greater than fifty (50) and a plasticity index greater than thirty (30).

(3) The subgrade surface shall be brought to the specified lines, grades and cross-sections by repeatedly adding or removing material and compacting to the specified density with suitable compaction equipment to perform these operations.

# Current Code, Sec. 32-36. New and rehabilitated streets.

Soil test results of the areas to be paved will be provided to the city engineer prior to construction. The common soil test for road construction includes classification of soil, particle size distribution, moisture  content determination, specific gravity, liquid limit and plastic limit tests. Moisture content, particle size and specific gravity tests on soils are used for the calculation of soil properties such as degree of saturation. Based on the test results, soil stabilization may be required. Soil stabilization, if required, will be accomplished using lime or cement.

# Recommendations

1. The city should not accept anymore concrete street into the inventory. If contractor/developers elect to build concrete streets the streets should remain private. This (streets remain private language) could be added to clarify the current Code.

2. Per City Code, Sec 12-19, all contractors need to be tested on the new code prior to the city issuing their 2021 business licenses. Contractors, per the Code, should take the test annually prior to receiving their business licenses. This will ensure that contractors keep up with new Code requirement and problem areas that are occurring in the city. Minimum score should be 80%.

3. There needs to be a discussion as to when the city accepts streets in new developments when construction is still underway.

# Conclusion

**“*No one likes change, even when change is necessary*” Glenn Balliew**

**The previous slides are just an small example of the contractor built concrete streets that the Public Works Department is task to repair. There is not enough funding to tear these streets out and replace them or even bring them to a manageable level within a reasonable timeframe.**

**At this point the City is stuck with these failing streets but should not add more like them to the inventory. No matter the reason, one fact is absolutely certain, concrete streets have failed and are failing at a fast and alarming rate and there is not enough tax revenue to address this problem.**

**Insanity: doing the same thing over and over and expecting a different result.**

**8 September 2020: The Airport and Transportation Commission vote unanimously to accept the new Code as written as it relates to concrete and asphalt streets.**

# THE END


2019 concrete repair remnants. This is only one year of concrete repairs in Kirksville.