Chapter 916 Residential Compatibility Standards
and
Chapter 917 Operational Performance Standards
Text Amendments

Noise Survey

June 2-3, 2016

Revision 1 - 6/5/2016

Prepared For:

Councilman Danial Gilman
City Council District 8
510 City-County Building
414 Grant Street
Pittsburgh, PA 15219
Voice: 412-255-2113
E-mail: daniel.gilman@pittsburghpa.gov

Corey Layman, AICP
Zoning Administrator
Department of City Planning
200 Ross Street, Suite 309
Pittsburgh, PA 15219
Voice: 412-255-2241
E-mail: corey.layman@pittsburghpa.gov

Contract #: NA

Submitted By:

Norman J. Cleary
Principal Engineer
Cleary Consulting LLC
4323 Parkman Avenue
Pittsburgh, PA 15213
P: 412-303-2201
F: 412-894-0989
norman.cleary@cleary-consulting.com

CLEARY CONSULTING LLC
Technology for Business
Education/Entertainment

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1. General

This document reports noise levels measured at locations stipulated by Erika Strassburger by E-mail transmission on May 2, 2016. These locations were selected in collaboration with Dan Wood and Kevin Kerr. The Butler Street, Lawrenceville and Walnut Street, Shadyside referenced locations did not specify which side of those streets should be measured. We measured both sides for this report.

Actual Sound Pressure Level Measurements were conducted in conformance with Chapter 917.02.A. using "S" or Slow time weighting (LAS). In addition "F" or Fast time weighting, following the human hearing perception at lower sound pressure levels, (LAF) was measured. Continuous background noise levels are more accurately measured using Time-Averaging **with A frequency weighting over a 30 second measurement time period** (LAeq30). All three measurement methods were used to assure the most critical sound level measurement results.

2. Noise Measurements Executive Summary

916.06. - Noise. (Revisions)
No use subject to Residential Compatibility Standards shall generate noise in excess of **55 db(A)** or 3dB(A) above Background Sound Level between the hours of 10:00 p.m. and 6:00 a.m. (Nighttime). This represents a 10 dB(A) increase over current Zoning Code.

No use subject to Residential Compatibility Standards shall generate noise in excess of **65 dB(A)** or 3dB(A) above Background Sound Level at all other times (Daytime). This represents a 10 dB(A) increase over current Zoning Code.

Table 1 illustrates (LAS) and (LAeq30) measurements recorded during Daytime hours at the stipulated locations.

LOCATION	DAYTIME dB(A) (LASmax)	DAYTIME (LAeq30)
16th St. and Sarah St.	52.3	52.0
Meyran Ave and Bates St.	48.1	49.3
42nd St. near Davison St.	52.0	52.9
42nd St. near Foster St.	50.3	50.9
Ivy St. near Elmer St.	46.0	46.8
Ivy St. near Howe St.	50.9	51.0

Table 1

Background Sound Levels in excess of the current Zoning Code Daytime limit of 55 dB(A) were not detected at any of the stipulated locations. Code revisions would permit noise in excess of worst case Background Sound Levels by 12.1 dB(A) and 15.07 dB(A) over the six sample average.

Table 2 illustrates (LAS) and (LAeq30) measurements recorded during Nightime hours at the stipulated locations.

LOCATION	NIGHTTIME dB(A) (LASmax)	NIGHTTIME (LAeq30)
16th St. and Sarah St.	42.9	45.9
Meyran Ave and Bates St.	48.3 *	49.4*
42nd St. near Davison St.	43.6	45.6
42nd St. near Foster St.	41.6	43.6
Ivy St. near Elmer St.	42.2	43.9
Ivy St. near Howe St.	43.6**	44.9**

Table 2

Background Sound levels in excess of the current Zoning Code Nighttime limit of 45 dB(A) were only detected at one location, Meyran Ave and Bates St.* Code revisions would permit noise in excess of worst case Background Sound Levels, at this location, by 6.7 dB(A) and 11.3 dB(A) over the six sample average.

(* See Note 1)
(** See Note 2)

3. Broadband Measurement Results Key

A= **A-Frequency Weighting Filter per IEC 61672:** This filter is applicable for most common sound pressure level measurement following human hearing perception at lower sound pressure levels.

S= **Slow Time Weighting:** Long attack and release response time, t=1 second; the time weighting defines how changes of the instantaneous sound pressure level are averaged for useful sound pressure level results.

F= **Fast Time Weighting:** Short attack and release response time, t=125ms; the time weighting defines how changes of the instantaneous sound pressure level are averaged for useful sound pressure level results. The fast time weighting is commonly used. In this case, fast time weighting is used for the Time-Average Sound Level measurement. (See LAeq30)

LAS Actual Sound Pressure Level (SPL) with A frequency weighting and S (Slow) time weighting.

LAF= Actual Sound Pressure Level (SPL) with A frequency weighting and F (Fast) time weighting.

min = Measurement of the minimum noise level during a measurement period.

max= Measurement of the maximum noise level during a measurement period.

LAeq= **Time-Average Sound Level or Equivalent Continuous Sound Level:** Averaged sound level over time with A frequency weighting. In this case all Time Average measurements use a 30 second measurement period **(LAeq30)**

LAPeak= **Peak Sound Level:** Measures the peak sound pressure level with A frequency weighting.

4. Sound Level Measurements

A. 16th Street and Sarah Streets (South Side)

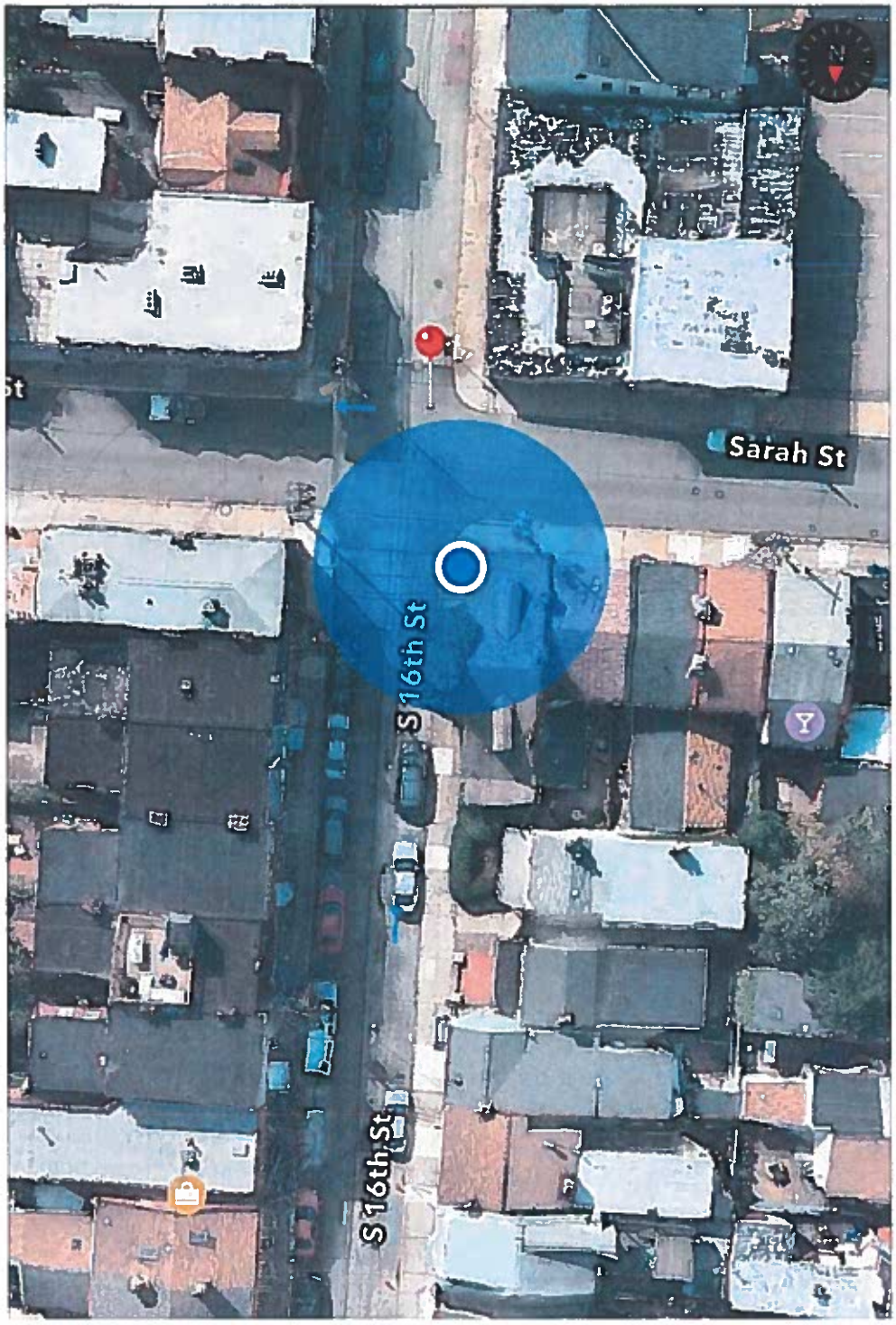

Figure 1. Blue Dot indicates approximate measurement location.

XL2 Sound Level Meter Reporting File 019R Daytime Measurement Location A

Temperature:	83°F
Relative Humidity	55%

Configuration

Start:	2016-06-02, 15:07:02
End:	2016-06-02, 15:07:32
Timer mode:	repeat
Timer set:	00:00:30
Mic Sensitivity:	31.3 mV/Pa
Mic Type:	NTi Audio M4260, S/N: 1257,

Broadband Results

LASmax	**52.3**	**dB**
LASmin	52.2	dB
LAFmax	**52.3**	**dB**
LAFmin	51.8	dB
LAeq	**52.0**	**dB**
LAPeak	62.1	dB

XL2 Sound Level Meter Reporting File 002R Nighttime Measurement Location A

Temperature:	75°F
Relative Humidity	85%

Configuration

Start:	2016-06-03, 01:44:54
End:	2016-06-03, 01:45:24
Timer mode:	repeat
Timer set:	00:00:30
Mic Sensitivity:	31.3 mV/Pa
Mic Type:	NTi Audio M4260, S/N: 1257

Broadband Results

LASmax	**42.9**	**dB**
LASmin	42.1	dB
LAFmax	**45.2**	**dB**
LAFmin	42.1	dB
LAeq	**45.9**	**dB**
LAPeak	57.4	dB

B. Meyran Avenue and Bates Street (Oakland)

Figure 2. Blue Dot indicates approximate measurement location.

XL2 Sound Level Meter Reporting File 010R Daytime Measurement Location B

Temperature:	81°F
Relative Humidity	55%

Configuration

Start:	2016-06-02, 12:34:28
End:	2016-06-02, 12:34:58
Timer mode:	repeat
Timer set:	00:00:30
Mic Sensitivity:	31.3 mV/Pa
Mic Type:	NTi Audio M4260, S/N: 1257

Broadband Results

LASmax	**48.1**	**dB**
LASmin	47.1	dB
LAFmax	**49.8**	**dB**
LAFmin	47.1	dB
LAeq	**49.3**	**dB**
LAPeak	62.7	dB

XL2 Sound Level Meter Reporting File 021R Nighttime Measurement Location B

Temperature:	75°F
Relative Humidity	85%

Configuration

Start:	2016-06-03, 02:46:57
End:	2016-06-03, 02:47:27
Timer mode:	repeat
Timer set:	00:00:30
Mic Sensitivity:	31.3 mV/Pa
Mic Type:	NTi Audio M4260, S/N: 1257

Broadband Results

LASmax	48.3	dB* (See Note 1)
LASmin	47.3	dB
LAFmax	49.6	dB
LAFmin	47.3	dB
LAeq	49.4	dB* (See Note 1)
LAPeak	61.3	dB

C. 42nd Street near Davison Street (Southeast of Butler Street, Lawrenceville)

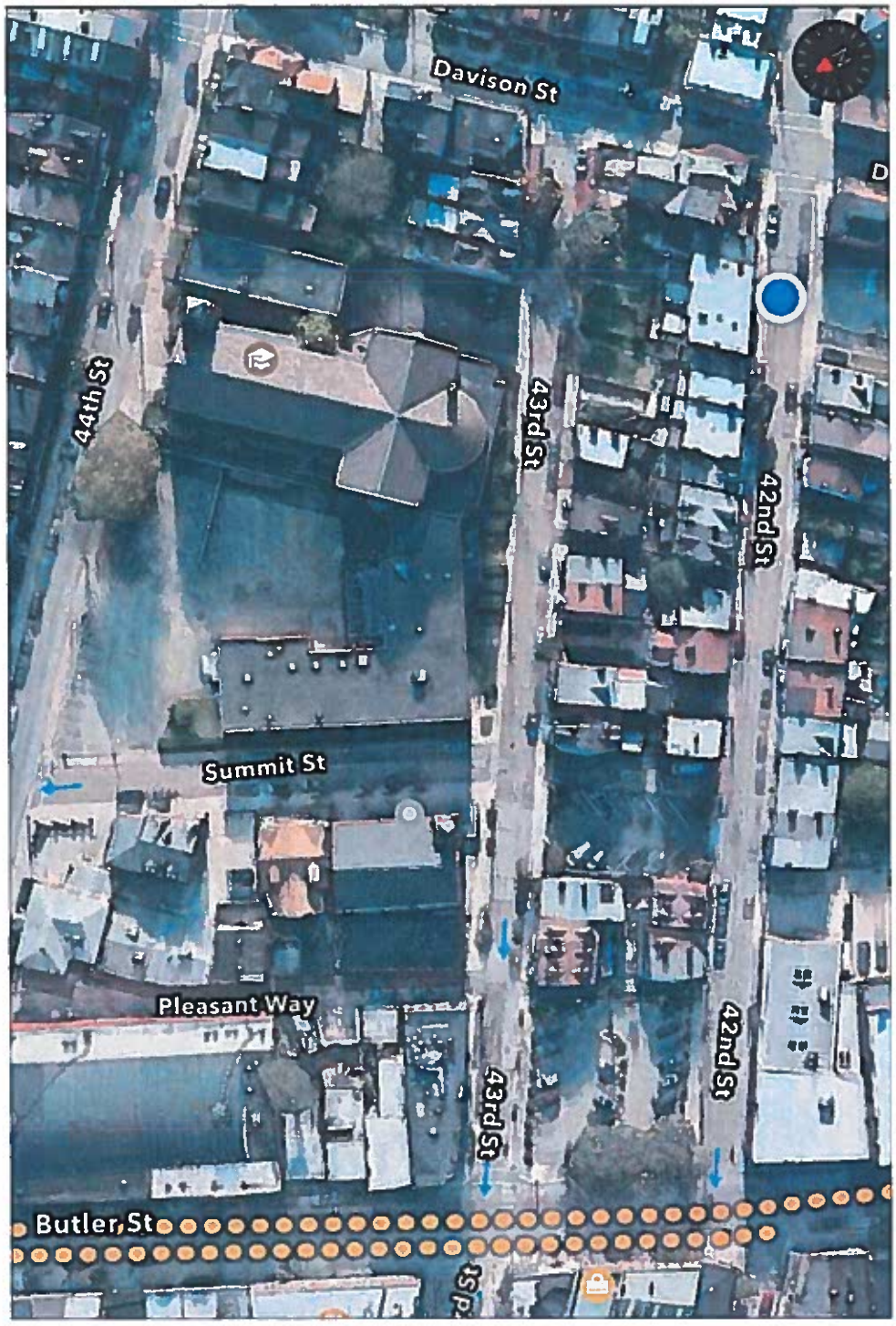

Figure 3. Blue Dot indicates approximate measurement location.

XL2 Sound Level Meter Reporting File 010R Daytime Measurement Location C

Temperature:	83° F
Relative Humidity	55%

Configuration

Start:	2016-06-02, 15:49:10
End:	2016-06-02, 15:49:40
Timer mode:	repeat
Timer set:	00:00:30
Mic Sensitivity:	31.3 mV/Pa
Mic Type:	NTi Audio M4260, S/N: 1257

Broadband Results

LASmax	**52.0**	**dB**
LASmin	51.3	dB
LAFmax	**53.2**	**dB**
LAFmin	51.3	dB
LAeq	**52.9**	**dB**
LAPeak	64.6	dB

XL2 Sound Level Meter Reporting File 021R Nighttime Measurement Location C

Temperature:	75° F
Relative Humidity	85%

Configuration

Start:	2016-06-03, 02:08:58
End:	2016-06-03, 02:09:29
Timer mode:	repeat
Timer set:	00:00:30
Mic Sensitivity:	31.3 mV/Pa
Mic Type:	NTi Audio M4260, S/N: 1257

Broadband Results

LASmax	**43.6**	**dB**
LASmin	39.9	dB
LAFmax	**46.0**	**dB**
LAFmin	39.9	dB
LAeq	**45.6**	**dB**
LAPeak	59.0	dB

D. 42nd Street near Foster Street (Northwest of Butler Street, Lawrenceville)

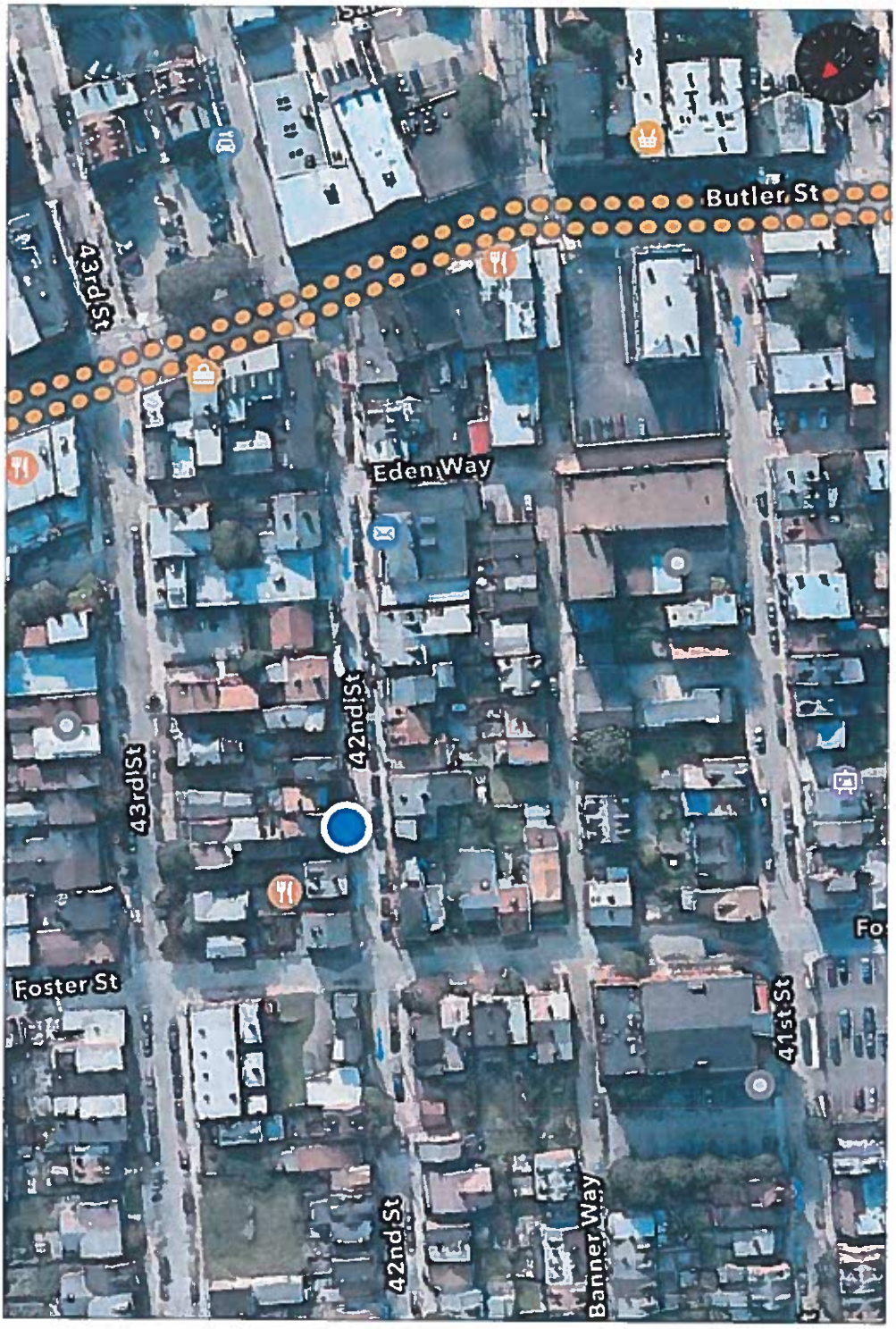

Figure 4. Blue Dot indicates approximate measurement location.

XL2 Sound Level Meter Reporting File 014R Daytime Measurement Location D

Temperature:	83° F
Relative Humidity	55%

Configuration

Start:	2016-06-02, 16:06:33
End:	2016-06-02, 16:07:03
Timer mode:	repeat
Timer set:	00:00:30
Mic Sensitivity:	31.3 mV/Pa
Mic Type:	NTi Audio M4260, S/N: 1257

Broadband Results

LASmax	**50.3**	**dB**
LASmin	49.0	dB
LAFmax	**51.9**	**dB**
LAFmin	49.0	dB
LAeq	**50.9**	**dB**
LAPeak	66.0	dB

XL2 Sound Level Meter Reporting File 014R Nighttime Measurement Location D

Temperature:	75° F
Relative Humidity	85%

Configuration

Start:	2016-06-03, 02:17:01
End:	2016-06-03, 02:17:32
Timer mode:	repeat
Timer set:	00:00:30
Mic Sensitivity:	31.3 mV/Pa
Mic Type:	NTi Audio M4260, S/N: 1257

Broadband Results

LASmax	**41.6**	**dB**
LASmin	39.0	dB
LAFmax	**44.0**	**dB**
LAFmin	39.0	dB
LAeq	**43.6**	**dB**
LAPeak	56.9	dB

E. Ivy near Elmer (Northwest of Walnut Street, Shadyside)

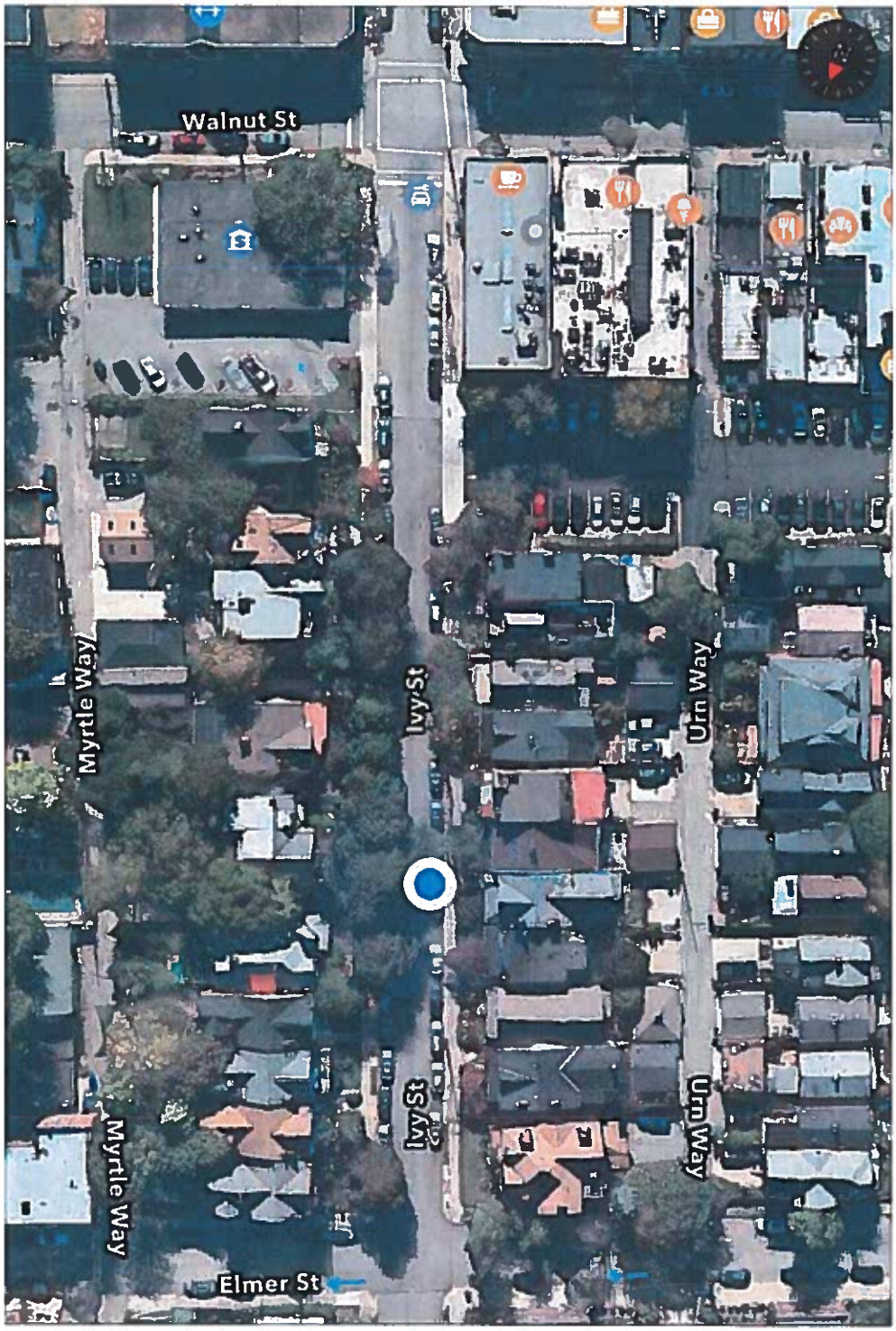

Figure 5. Blue Dot indicates approximate measurement location.

XL2 Sound Level Meter Reporting File 013R Daytime Measurement Location E

Temperature:	78° F
Relative Humidity	55%

Configuration

Start:	2016-06-02, 12:55:14
End:	2016-06-02, 12:55:45
Timer mode:	repeat
Timer set:	00:00:30
Mic Sensitivity:	31.3 mV/Pa
Mic Type:	NTi Audio M4260, S/N: 1257

Broadband Results

LASmax	46.0	dB
LASmin	43.8	dB
LAFmax	48.3	dB
LAFmin	43.8	dB
LAeq	46.8	dB
LAPeak	62.2	dB

XL2 Sound Level Meter Reporting File 015R Nighttime Measurement Location E

Temperature:	75° F
Relative Humidity	85%

Configuration

Start:	2016-06-03, 02:28:20
End:	2016-06-03, 02:28:51
Timer mode:	repeat
Timer set:	00:00:30
Mic Sensitivity:	31.3 mV/Pa
Mic Type:	NTi Audio M4260, S/N: 1257

Broadband Results

LASmax	42.2	dB
LASmin	40.0	dB
LAFmax	44.1	dB
LAFmin	40.0	dB
LAeq	43.9	dB
LAPeak	58.9	dB

F. Ivy near Howe (Southeast of Walnut Street, Shadyside)

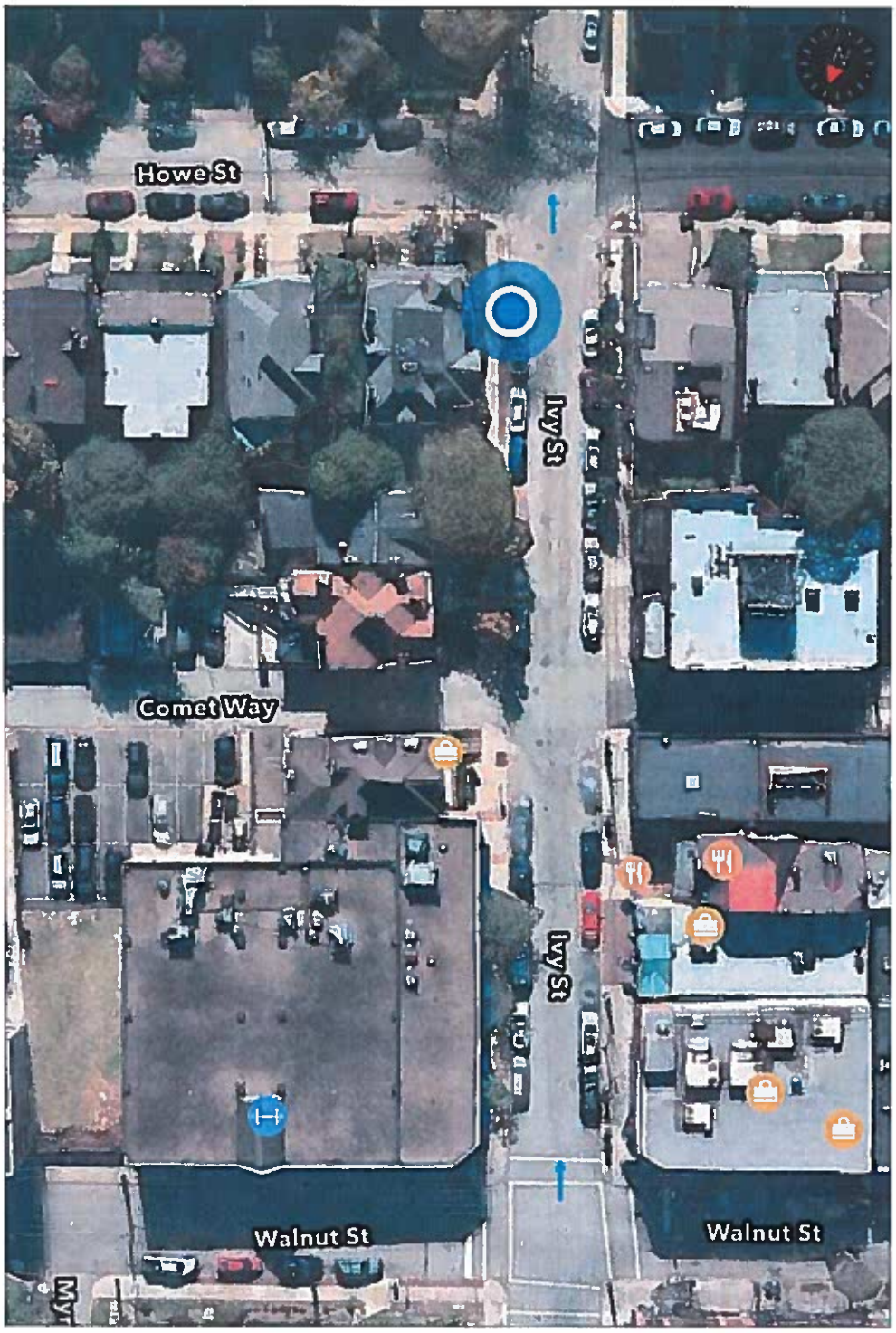

Figure 6. Blue Dot indicates approximate measurement location.

XL2 Sound Level Meter Reporting File 015R Daytime Measurement Location F

Temperature:	78° F
Relative Humidity	55%

Configuration

Start:	2016-06-02, 13:06:04
End:	2016-06-02, 13:06:35
Timer mode:	repeat
Timer set:	00:00:30
Mic Sensitivity:	31.3 mV/Pa
Mic Type:	NTi Audio M4260, S/N: 1257, Last Calibration: 2009-10-18

Broadband Results

LASmax	**50.9**	**dB**
LASmin	50.3	dB
LAFmax	**52.0**	**dB**
LAFmin	48.8	dB
LAeq	**51.0**	**dB**
LAPeak	64.6	dB

XL2 Sound Level Meter Reporting File 019R Nighttime Measurement Location F

Temperature:	75° F
Relative Humidity	85%

Configuration

Start:	2016-06-03, 02:34:05
End:	2016-06-03, 02:34:35
Timer mode:	repeat
Timer set:	00:00:30
Mic Sensitivity:	31.3 mV/Pa
Mic Type:	NTi Audio M4260, S/N: 1257

Broadband Results

LASmax	43.6	dB
LASmin	42.6	dB
LAFmax	45.3	dB
LAFmin	42.6	dB
LAeq	44.9	dB
LAPeak	55.9	dB

5. Notes

Note 1 : Meyran Avenue at Bates Street Background Noise Levels.

Buildings in close proximity to this measurement location contain a high concentration of window air conditioning units. Many were in operation during the measurement period. The cumulative effect of multiple units contributed to the slightly elevated ambient noise level reading.

Note 2: Ivy Street Background Noise Levels, Contributing Factors on Howe Street.

Example of Possible Residential Compatibility Nighttime Noise Violation

5533 Howe Street uses an enclosed space located under the front porch for trash bin storage. (See Figure 8) This storage space is equipped with a ventilation fan facing the neighboring 5531 Howe Street property. Both properties' building lines appear to sit within the setback placing them in very close proximity. (See Figure 7)

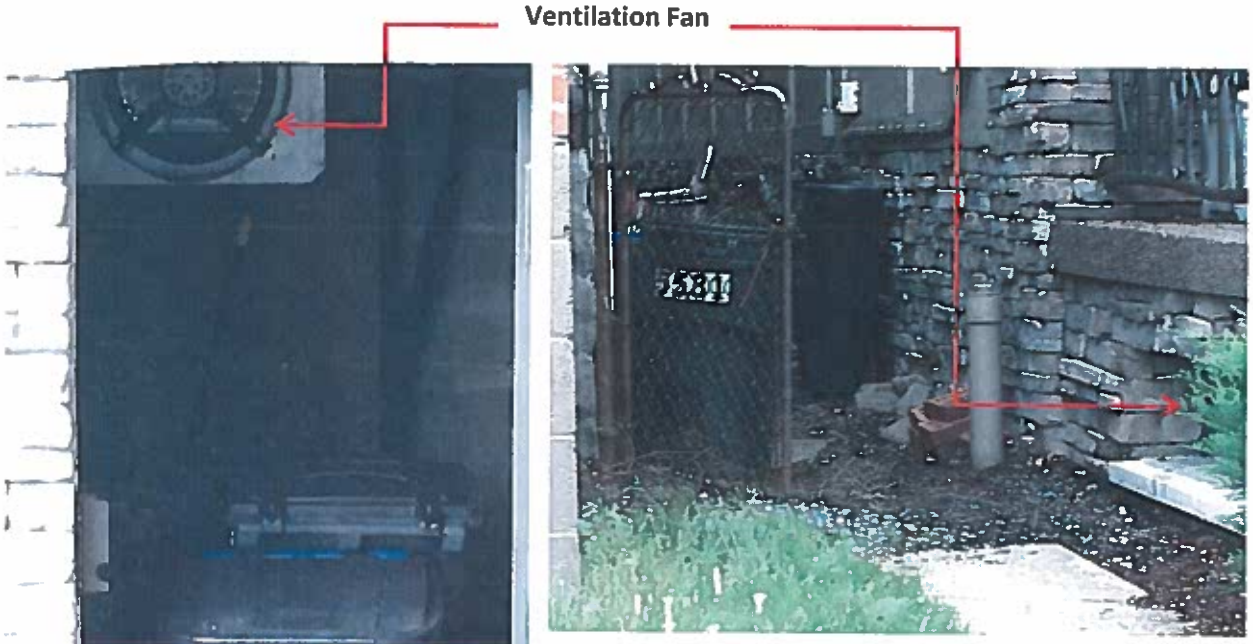

Figure 7

Figure 8

The fan noise, measured at the Howe St. sidewalk between the two properties, is 55dB(A) daytime and nighttime. Our measurement on Ivy Street near Howe was undoubtedly affected by the fan noise from the 5533 property and is most likely a contributor to the +1.4 dB(A) nighttime difference between the two Ivy Street measurements. Compliance with current Zoning Code could be achieved by replacing this fan or

reducing the fan velocity (variable speed fan control) during nighttime hours. Multiple factors contributed to the daytime Ivy Street background noise differences including landscape and delivery truck activity.

6. Instrumentation

- Acoustic Analyzer: NTi Audio XL2 Serial Number: A2A-02310-DO
  Firmware: V1.03
- Microphone: NTi M4260 Serial Number: 1257
- Sound Level Calibrator: IEC 60942 Serial Number: 141010218

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Architecture
Workplace Design
Urban Design
Preservation

Suite 800
Benedum Trees Building
223 Fourth Avenue
Pittsburgh, PA 15222

Voice: 412.471.2470
Fax: 412.471.2472
Website: www.pfaffmann.com

PFAFFMANN+ASSOCIATES PC

Robert S. Pfaffmann, AIA
Principal

February 14, 2017

City of Pittsburgh
City Council Meeting, Committee on Hearings
Testimony by Robert S. Pfaffmann, FAIA, AICP
President, Pfaffmann + Associates
File Number: 216-0034, Zoning Code Text Amendment, Noise/Construction Management

Subject: Ordinance amending portions of Chapter 916, 917, 926 to provide current and more enforceable construction and noise standards for the City of Pittsburgh.

As the City of Pittsburgh grows again, many neighborhoods are seeing unprecedented growth and vitality with new construction and new businesses. New development, while beneficial, has sometimes had an unintended negative environmental impact on the quality of life for residents and workers alike.

I am writing in conditional support of the proposed zoning amendments regarding noise and construction management.

I participated in an informal technical working group hosted by the offices of councilmen Lavelle, Kraus and Gilman, Zoning Administrator Corey Layman, and PLI Director Maura Kennedy. Our focus was the development of practical revisions to the existing code language.

Best Practices
We benchmarked best noise and construction mitigation practices from other cities, including Seattle and New York City. We learned that these codes are far more extensive and detailed and include interpretive guides to implementation of construction and noise mitigation. While we would like to have seen a more extensive rewrite in the manner of these cities we agreed to work within the limitations of the current code structure.

This legislation is a good start and should be implemented. However, as Norm Cleary's technical review and testimony indicates, more work is needed to address downtown performance criteria.

Noise Levels Revisions
Consistent enforcement in residential districts located close to noise impacts from institutional and neighborhood business districts should be more easily enforced thanks to Mr. Cleary's analysis. While the residential compatibility code revisions are more accurately defined and hence easier to enforce, greater attention will be needed to review of planning and construction projects coming through PLI and the City Planning Commission.

The predominant impacts are related to conduct (ie Backyard Parties and rooftop venues) and Performance (ie Exhaust Fans, Condenser Units and Cooling Towers).

Operational Performance (Section 917.06)
While basic questions of noise levels have been addressed in Residential Compatibility Standards, The operational impact of construction operations (ie; Jack hammers, sand blasting, diesel engines) and operational maintenance (ie; poorly design/maintained Fans, condensers and cooling towers) is also a key part of this legislation. I would encourage Council and the City Planning Department to develop new monitoring technologies that many other cities are using or requiring of developers.

"Urban Canyons"
In general, the Downtown area has higher ambient sound and air pollution levels that create a different set of challenges that need further testing and adjustment. Having spent most of my professional life working in downtown Pittsburgh, I am acutely aware of the impacts of noise and air pollution in downtown's "urban canyons". Research studies are just now revealing the highly concentrated air pollutants, especially construction operations and diesel pollution. Likewise noise levels created on tall narrow streets like Penn Avenue or 4th Avenue are often well beyond OSHA standards for workers, yet the average pedestrian is unprotected.

The requirement for a construction management plan in Section 917 is a good start but will require attention from the City Planning Staff and Commission to demand proper mitigation. Like the noise provisions, the construction impact provisions are an improvement but will probably need to be revised as new data is collected. There are important weaknesses to be aware of: Public Works construction is exempt. Many projects involve jack hammering, hydro demolition and sawing that create very dangerous sound and dust pollution conditions that are hard to enforce without a larger campaign by the City to reduce these sources by its private contractors.

As an example, in New York City, construction equipment is often required to be enclosed in simple-to-erect, temporary, acoustically-designed absorptive enclosures or tents. You can see an example of these at the base of the Liberty Bridge along the Eliza Furnace Trail. If PennDOT can do it why can't the city's agencies set new policies to protect people who have no way to avoid increasing damage to our citizen's hearing and breathing?

Future Enhancements: Green Codes & Metrics
While I support these improvements before you today, I encourage Council, and the many City agencies that you interact with, to continue to push for a cleaner environment in our neighborhoods and downtown.

The use and creation of green performance standards such as LEED, and the City's own newly created "P4" metrics (People Planet Place Performance) have criteria that focus on environmental quality are a perfect place to innovate. Much of the attention on pollution focuses on regional impacts like Clairton Coke Works, but I believe we have potentially far more dangerous localized impacts on asthma and hearing loss right under our own ears and lungs.

Thank you for your leadership on an important aspect of Pittsburgh's quality of life and public health so crucial to attracting and retaining talent.

Robert S. Pfaffmann, AIA

PITTSBURGH
DOWNTOWN
PARTNERSHIP

February 14, 2017

Prepared testimony by the Pittsburgh Downtown Partnership to City of Pittsburgh Council regarding proposed amendments to Title 9 of the Code of Ordinances

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The Central Business District is home to over 130,000 workers and 5,000 residents, a roughly 100% population increase since 2000. It has become the dining and entertainment destination of the region and services millions of visitors each year, making Downtown an ideal location for investment and development of all types. With this, however, comes potential for compatibility issues between various uses.

The Pittsburgh Downtown Partnership has fielded numerous calls and emails over time concerning overnight noise issues specifically related to construction, and we are generally supportive of rules and regulations that create a harmonious balance of a vibrant urban center with those who call it home.

With that said, after consultation with the Zoning Administrator, we have a number of concerns with respect to the proposed amendments' holistic approach to reduce nighttime construction impacts and its noise pollution, and the compatibility with development in Downtown.

1. **The proposed code amendments will regulate construction operations on developable land and parcels, but not City or Public Works projects, including PWSA, Parking Authority, and other public utilities.**

   The majority of complaints received by the PDP regarding nighttime construction noise is the result of City of Pittsburgh projects, whether performed by its employees, its contractors, or utilities working in the public right of way or in publicly owned facilities. Since this work would be exempted, there will be little to no change in nighttime construction noise while putting undue and unnecessary restrictions on private development.

2. **Non-impact construction work in Downtown is oftentimes preferred to be conducted prior to morning rush and after evening rush to limit obstructions within the public rights of way.**

   Downtown, as a commercially zoned district, may need to be treated differently than other residential neighborhoods and there should not be a one-size-fits-all approach to limiting construction activity between the hours of 7:00 a.m. and 8:00 p.m. Developers and contractors are oftentimes required to conduct work in the evening or on weekends in order to meet tight schedules or at the request of the City, PennDOT, and Port Authority to mitigate conflicts with daytime traffic and routing. Late-night noise restrictions can still be implemented while allowing general construction activity to occur.

Particularly in Downtown, we question the usefulness of these specific amendments if they will not provide nighttime reprieve and will potentially do harm to private investment. We urge the city to study the types of construction activity occurring in Downtown and its impact on the community.

With regard to the codification of a Construction Management Plan, the PDP is generally supportive of efforts to require CMP's for construction projects.

PITTSBURGH
DOWNTOWN
PARTNERSHIP

In our experience, pedestrian access is adversely impacted as a result of limited requirements for accommodations during construction operations. Too often we see sidewalks closed mid-block without additional means for pedestrians to get through or around. A clear and enforced CMP can dramatically improve the pedestrian experience throughout Downtown.

We recommend that the new Director of Mobility and Infrastructure be included in the CMP approval process along with the Directors of Public Works and Permits, Licenses and Inspections, Zoning Administrator in order to ensure accessibility concerns and the intent of the CMP is realized in accordance with the City's complete streets policy.

The Pittsburgh Downtown Partnership appreciates the forethought of this body to improve compatibility during construction and respectfully requests these comments be taken into consideration, including the dual impacts on developers and the public, before adopting the amendments as proposed.

--end of testimony--

City of Pittsburgh
City Council Meeting, Committee on Hearings
February 14, 2017
Testimony by
Norman J. Cleary
President, Schenley Farms Civic Association
File Number: 216-0034, Zoning Code Text Amendment, Noise/Construction Management

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Subject: Ordinance amending the Pittsburgh Code, Title Nine, Zoning Code, Article IV, Chapter 916, Residential Compatibility Standards, Section 916.05, Operating Hours, 916.06, Noise, Chapter 917, Operational Performance Standards, and Article IX, Chapter 926, Definitions, to provide current and more enforceable construction and noise standards for the City of Pittsburgh.

Council,

On October 27th of 2015 I testified in opposition to the subject text amendments presented to the City Planning Commission. One problematic example was **Section 2. 916.06 – Noise** that would have permitted a 10 dB increase in permissible noise over the current Code from 45 to 55 dB(A) between 10:00 p.m. and 6:00 a.m. The difference in loudness perception between 55 and 45 dB(A) is a ratio of 2:1. In other words, those proposed changes would have **DOUBLED** the permissible noise loudness in our city's residential neighborhoods.

There was little doubt that this was **not** what the Department of City Planning had intended. With the cooperation of Councilman Gilman, Zoning Administrator Corey Layman, PLI Director Maura Kennedy, Councilman Lavelle, Krauss and assigned staff; a working group was assembled to correct and refine the revisions to Chapters 916 and 917.

It became clear that we needed objective measurement of the actual daytime and nighttime sound pressure levels in certain areas of the city to validate the limits to be specified in the Code. Locations identified as problematic by Dan Wood and Kevin Kerr were measured. The Schenley Farms Civic Association sponsored a comprehensive Noise Survey that I've asked to be distributed to you. The Executive Summary, starting on page three, illustrates that there is no reason to raise daytime and nighttime Residential Compatibility Standards noise level limits. "3 dB(A) above Background Sound Level" was added to accommodate areas with ambient sound levels close to the 916.06 specified limits. We are confident that the Chapter 916 language before you is correct.

Chapter 917.02B Maximum Permitted Sound Levels now permits 60 dB(A) nighttime, or 5 dB greater than current Code allows, at residential property lines in districts not zoned Residential. Since Downtown locations were not measured in the Survey, I cannot confirm that this revision to the

Zoning Code is appropriate. What I can tell you is that this now permits **three times** the nighttime noise loudness Downtown than is permissible in areas zoned Residential.

The addition of 917.06 Construction Operations and Section 4 Paragraph 56.1 Construction Management Plan should be beneficial to the control of construction related noise Downtown.

If Council would like us to explore Downtown noise further, we would be willing to do so.

Thank you,

Norman J. Cleary
President
Schenley Farms Civic Association

Principal Engineer
CLEARY CONSULTING LLC