PACIFIC BELL

LOCATONS	FEE	IZE (FT	COST
LNUT CANYON RD. AT NATURE CENTER	$6.66	2	$13.32
ELLOGG & LA PALMA	$6.64	46	$305.44
KNOTT AVE. 330' N/O BALL RD.	$6.64	1	$6.64
F/O 369 S. BASIL ST.	$2.82	5	$14.10
F/O 8180 KENNEDY RD.	$2.82	5	$14.10
ANAHEIM HILLS RD. 145' N/O TO 225' SO NOHL RANCH RD.	$2.55	356	$907.80
WILDFLOWER LANE 200' N/W OF AZELEA WAY	$7.94	286	$2,270.84
SANTA ANA CYN RD. 176' W/O MOHLER DRIVE	$2.55	12	$30.60
ANAHEIM BLVD. (AT I5) BETWEEN CERRITOS & KATELLA	$2.55	9	$22.95
SUNSET RIDGE RD. AND VIEW RIM DR.	EXEMPT	146	$0.00
E. BAJA 80' N/O BAJA DR.	$2.82	4	$11.28
TANGLEWOOD AVE. E/O WOODWIND LN.	$2.82	233	$657.06
TANGLEWOOD AVE. E/O WOODWIND LN.	$2.82	4	$11.28
WALNUT CNYN RD. FROM NOHL RNCH RD. TO 100' E/O PASEO CUMBRE	$6.66	684	$4,555.44
EAST ST. AT CHESTNUT AVE.	$2.55	3	$7.65
KNOTT AVE. AT BALL RD.	$6.64	205	$1,361.20

SUBTOTAL $10,189.70

WAKEFIELD AVE. AT WAVERLI	$2.82	166	$468.12
DROCK ST. FROM RIVERDALE AVE. TO 80' N/O REDROCK	$2.82	2001	$5,642.82
VAVERLY DR. 311' TO WAKEFIELD	EXEMPT	9	$0.00
STATE COLLEGE AND GENE AUTRY WY.	$2.55	6	$15.30

SUBTOTAL $6,126.24

W. AUDRE DR. & S. WALNUT ST.	$7.66	9	$68.94
N/S LINCOLN 140' E/O SUNKIST, N/S LINCOLN 245' W/O SUNKIST	$8.68	9	$78.12
CLAUDIA ST. AND CENTER	$7.66	8	$61.28
ALLEY R/O 1559 BENMORE LN.	$2.82	3	$8.46

SUBTOTAL $216.80

SECTION 4

CITY ENGINEER'S ASSOCIATION OF ORANGE COUNTY RESEARCH AND RECOMMENDATIONS

4.1 MEMORANDUM FROM THE CITY ENGINEER'S ASSOCIATION OF ORANGE COUNTY PAVEMENT SUBCOMMITTEE

4.2 ISSUE PAPER ON THE IMPACTS OF UTILITY CUTS ON PAVEMENT

4.3 MODEL ORDINANCE

MEMORANDUM

To: City Engineers' Association of Orange County

Date: January 5, 1996

From: George Alvarez, Chairman of Pavement Subcommittee

Subject: REPORT FROM PAVEMENT SUBCOMMITTEE

The Pavement Subcommittee has approved and released for your information and use the following:

- Issue paper outlining the impacts of utility cuts on pavement performance and mitigation.
- Model ordinance to establish a street deterioration fee to provide a funding source for the future repairs made necessary by the utility cuts.
- Optional trench requirements which are utilized by various Orange County cities and which can be adopted and implemented as appropriate for your agency.

These documents were the result of participation from the seven subcommittee members. The subcommittee met five times, the latter two meetings included representatives from the utility companies to establish a collaboration approach to resolve the issue of utility cuts. While much has been accomplished, the subcommittee will continue meeting with the utility companies and most importantly invite representatives from the telecommunication companies. Areas of opportunity for improvement are coordination between city projects and telecommunication company facility installation, use of joint trench, and optional construction methods. Our goal is to reduce the number of pavement cuts to maximize the pavement life.

While the subcommittee has approved the model ordinance, the fee schedule may vary for each city depending on the pavement replacement value costs. A copy of the model ordinance has been submitted to the Orange County City Attorney's Association for their review and comments.

Also enclosed are two reports prepared for the City of Anaheim. The LaBelle Marvin report is to prepare a standard trench repair specification and the IMS report is to estimate a pavement cut fee. These reports are for your information and should not be used without the consent of LaBelle Marvin and IMS, respectively. Copies of executive summary reports prepared for Southern California Gas Company to evaluate repair patches for asphalt paved streets are also enclosed for your information.

If you have any questions, please contact any of the subcommittee members. We'll continue to provide you with updates and recommendations as they become available.

Attachment

SUBJECT: IMPACTS OF UTILITY CUTS ON PAVEMENT

BACKGROUND

The public street system is one of a City's most valuable assets. Cities struggle to maintain the quality of this investment with limited funds. Street maintenance is continually a priority to cities and their residents. A recent voter survey for OCTA found that nearly 80% of those surveyed rated street maintenance and improvement as important, 31.5% rated it very important. In the same survey, maintaining existing streets rated above widening freeways and building mass transit rail.

However, the recent trend to deregulate telecommunications and increase competition could significantly effect a cities ability to maintain the quality of the street system. As competition for telecommunications services increase, a number of companies can be expected to begin cutting into the public streets to install their facilities.

Recent studies have shown that the deterioration caused by these cuts, and other utility cuts, are immediate and will worsen over time. These studies show that utility cuts significantly reduce the life of the pavement, and not only at the location of the cut. The reduced life propagates beyond the area of the cut to the surrounding pavement. This results in the loss of millions of dollars worth of pavement life and increased maintenance cost to our residents.

STUDIES

The following studies are the more significant in recent years that analyze the impacts of utility cuts on pavement life:

IMPACT OF UTILITY CUTS ON PERFORMANCE OF STREET PAVEMENTS - City of Cincinnati and American Public Works Association, 1995

THE EFFECT OF UTILITY CUTS ON THE SERVICE LIFE OF PAVEMENTS IN SAN FRANCISCO - City and County of San Francisco, May 1995

THE EFFECTS OF UTILITY CUT PATCHING ON PAVEMENT PERFORMANCE IN PHOENIX, ARIZONA - City of Phoenix, Arizona, July 1990

COSTING THE EFFECTS OF UTILITY CUTS IN THE LIFE CYCLE OF ASPHALT PAVEMENTS - Burlington, Vermont, September 1986

All reports conclude with the same findings: **"Utility cuts produce damage that propagates beyond the area excavated; even the highest restoration standards do not remedy all the damage. Utility cuts cause the soil around the cuts to be disturbed, cause the backfilled soil to be compacted to a different degree than the soil around the cut, and produce**

discontinuities in the soil and the wearing surface. Therefore, the reduction in pavement service life due to utility cuts is an inherent consequence of the trenching process."(City and County of San Francisco Study, 1995)

Typical results show that the life of a pavement is reduced from a design life of 20 years to a useful life of 15.5 years, a reduction of 4.5 years. The results of the Phoenix study and San Francisco studies are shown in Exhibits 1 and 2. In addition to the reduced pavement life, the Phoenix study found that the areas in and around utility patches required more extensive rehabilitation. **The study concludes that the reduced pavement life, coupled with the increased rehabilitation in patched areas, results in doubling the cost of pavement maintenance to the city.**

Using the results of these studies and some basic pavement value information, the cost to the city can be quantified. Infrastructure Management Services (IMS), a pavement management consultant, analyzed these costs for the City of Anaheim and determined the cost of a utility cut in an arterial street. These costs decrease as the pavement ages.

IMPACTS

The installation of telecommunication facilities in Orange County will require extensive excavation in streets of all ages in every city. The damage that the construction of these facilities will cause must be addressed by cities before it occurs. Cities cannot afford to wait 5 to 10 years and, when the streets are in disrepair, try to find funding for necessary repairs.

Utility companies who utilize the public right of way should be required to pay for the damage they cause, whether immediate or long term. Typical franchise agreements require utilities to restore the streets to as good a condition as before their excavation, however the studies have shown that current standards and requirements are not adequate. The San Francisco study notes **The City and County of San Francisco has one of the most stringent trench restoration requirements in the country. But even the highest standards cannot mitigate the damage caused by these utility cuts.** Based on these findings, a mechanism must be developed to pay for the unavoidable costs.

MITIGATION

One proposal being considered by several cities in California is adoption of a street cut mitigation fee. A fee could be established through calculation of actual costs to the city, based on information and conclusions of studies available to date. Adoption of a street deterioration fee could have several important results. Not only would it provide a funding source for the future repairs made necessary by the utility cuts; but it could encourage coordination between the utility companies, coordination with city projects, and consideration of alternate methods of construction, ultimately reducing the number of utility cuts.

Based on the findings of studies which conclude that long term damage to streets in unavoidable, even with the best resurfacing efforts, adoption of a cost-based fee would ensure that utility companies take responsibility for the impacts of their facilities. Cities and their residents should not be required to pay for the damage caused by utility companies.

Committee Members:

George Alvarez, City of Santa Ana
Bob Hodson, City of Fullerton
Don Webb, City of Newport Beach
Bill Cameron, City of San Clemente
Al Vasquez, County of Orange
Harry Thomas, City of Orange
Gary Johnson, City of Anaheim
Natalie Meeks, City of Anaheim

January 5, 1996

SECTION 5

EXISTING FRANCHISE AGREEMENTS

5.1 SUMMARY OF EXISTING FRANCHISE AGREEMENTS

5.2 FRANCHISE FEES FOR FISCAL YEAR 1994-95

5.3 SOUTHERN CALIFORNIA EDISON FRANCHISE AGREEMENT

5.4 THE GAS COMPANY FRANCHISE AGREEMENT

5.5 CABLE TELEVISION FRANCHISE AGREEMENT

5.6 SECTION 7901 OF THE GOVERNMENT CODE - RULES REGULATING STATE FRANCHISE FOR TELECOMMUNICATION FACILITIES

SUMMARY OF EXISTING FRANCHISE AGREEMENTS

Seven companies currently hold franchise agreements with the City of Anaheim. These include Southern California Edison, The Gas Company, two cable companies, and three pipeline companies. These companies enjoy the right to locate their facilities within City streets and right of ways under the terms of their franchise agreements.

In general, the terms of these franchise agreements require the companies to repair any damage caused by their operations and to restore the streets to as good a condition as before their excavation. As an example, The Gas Company franchise agreement includes the following language:

> "If any portion of any street shall be damaged by reason of defects in any of the pipes and appurtenances maintained or constructed under this grant, or by reason of any other cause arising from the operations or existence of any pipes and appurtenances constructed or maintained under this grant, said grantee shall, at its own cost and expense, immediately repair any such damage and restore such street or portion of street to as good a condition as existed before such defect or other cause of damage occurred, such work to be done under the direction of the Engineer, and to his reasonable satisfaction."

Requirements are similar for telecommunication companies which operate under a state franchise, which allows utilization of public streets and right of ways for their facilities. Regulations governing state franchises require companies to comply with local ordinances regarding the repair of any and all damage caused by their facilities.

Although most of these companies demonstrate high construction standards and strive to repair the damage caused by their facilities, studies have shown that damage is inevitable. This damage results in lost pavement life and costs the City thousands of dollars per year currently, and this number will escalate during the build out of the anticipated telecommunication systems.

A review of the existing franchise agreements by both Public Works and the City Attorney's Office has found that the cost of street deterioration is not covered in the franchise agreements, and franchise fees are not intended to pay for any damage or cost incurred by the City. The Street Deterioration Fee is, therefore, a payment for the cost of repairs made necessary by the companies's operations, as specifically required by their franchise agreement.

Included in this report are copies of the franchise agreements for Southern California Edison, The Gas Company, and cable television; and Section 7901 of the Government Code regulating state franchises for telecommunication facilities. Also included is a summary of franchise fees paid to the City over the past three years.

City of Anaheim
Franchise Fee Analysis
FY 1994/95

No.	Revenue Source	FY1994/95
1071	Southern California Gas	$502,986
1072	Southern California Edison	$34,526
1073	Golden West Refining	$9,762
1074	Gulf Oil Corporation	$0
1075	4 Corners Pipeline	$6,099
1077	Texaco Oil Corporation	$1,564
1078	Southern California Water	$1,228
1079	Southern California Pipeline	$7,167
1081	Cable T.V. Franchise - Multivis.	$1,131,462
1082	Cable T.V. Franchise - Empire	$29,194
	Subtotal:	$1,723,988
	Right of Way - Water	$433,859
	Right of Way - Electric	$3,035,527
	Subtotal:	$3,469,386
	Combined Total:	$5,193,374

SECTION 6

UTILITY COMPANY COMMENTS

6.1 LOCAL UTILITY COMPANY COMMENTS - SUMMARY OF ISSUES

6.2 PACIFIC BELL CORRESPONDENCE

6.3 THE GAS COMPANY CORRESPONDENCE

6.4 SOUTHERN CALIFORNIA EDISON CORRESPONDENCE

6.5 A CRITIQUE OF "FINAL REPORT FOR THE STREET EXCAVATION IMPACT ASSESSMENT, PREPARED FOR THE CITY OF BURLINGTON, VERMONT"

6.6 EXCAVATION REPAIR STUDIES SUBMITTED BY THE GAS COMPANY

LOCAL UTILITY COMPANIES
SUMMARY OF ISSUES

Public Works has continually solicited comments from Anaheim's local utility companies in an effort to address their needs and concerns. Since the work shop in August, correspondence has been received and meetings have taken place with The Gas Company, Southern California Edison, and Pacific Bell. Additionally, a number of utility companies have formed a statewide inter-utility taskforce to address this issue more regionally. Staff has met with this taskforce through the Orange County City Engineer's Association and independently.

A number of the issues have been addressed through changes in the ordinance originally proposed. These changes include clarification on bonding and deposit issues, and eliminating the requirement to install additional conduit with telecommunication facilities. However, the key issue, adoption of the Street Deterioration Fee, remains unresolved. The utility companies have questioned the validity of the street deterioration studies, the relationship (nexus) between the recommended fees and the impact of their activities, and the ability of the City to adopt such a fee under current franchise agreements.

Staff concurs that validity of the street deterioration studies is a key issue. However, as discussed in Section 2, four studies have been provided which support the adoption of the fees. These studies were prepared by a variety of well respected experts and universities, studied under different criteria and climates, and all studies produced similar results.

Pacific Bell submitted a critique of the Burlington, Vermont study, prepared by the Institute of Gas Technology in 1989. Although this report criticized a number of the assumptions and analytical methods utilized in the Burlington, Vermont study, it failed to provide an independent analysis of the data with conflicting results. This report particularly criticized the study for not analyzing the possible reasons for deterioration in and around street cuts, however the intent of the study was not to assess the quality of workmanship for each excavation repair but to determine the average impact of street cuts on the life of the pavement. No critiques and/or independent analysis is available for the other street deterioration studies

The Gas Company provided the executive summaries of four studies performed by the Gas Company and their consultants which they contend contradicts with the findings of the street deterioration studies. However, these did not intend to, and do not, study the long term impact of trenches on pavement. These reports studied the performance of small scale repair excavations under different conditions and construction standards. Two of the studies are based on perceptions and theoretical modeling; and the two field surveys were short term and very limited in nature, comparing a standard vs. T-section pavement repair. These studies particularly focused on various compaction levels and the short term performance of the repair of a small excavation, finding that compaction was an important factor in excavation repair. Although the body of the reports were not made available, these reports appear to be valid for their intended use, however a correlation cannot be made between these studies and

the pavement deterioration studies which study long term deterioration of pavement due to utility trench repair

As for the nexus issue regarding the relationship between the recommended fee schedule and the impact of the utility companies, that is addressed in detail in Sections 2 and 3. The pavement deterioration factor from the Phoenix study was utilized along with a calculation of the true replacement value of the street pavement. The actual cost of the impacts of utility cuts was derived from this and utilized to develop the recommended fee schedule. The fees are, therefore, reasonable and justified

The franchise issues are covered in detail in Section 5. In summary, the existing franchises are clear in their requirements to pay for any and all damage caused by their operations. The accelerated deterioration of the pavement due to utility cuts is a direct cause of their operations and the cost of that deterioration should be borne by the responsible utility company.

SECTION 7

STATE WIDE DEVELOPMENTS

7.1 SUMMARY OF STATE WIDE DEVELOPMENTS

7.2 CITY OF SACRAMENTO - STAFF REPORT AND DRAFT ORDINANCE

7.3 CITY OF SAN DIEGO - DRAFT ORDINANCE

7.4 CITY OF SAN BERNARDINO - DRAFT ORDINANCE

SUMMARY OF STATE WIDE DEVELOPMENTS

Recent developments in the telecommunications industry has many cities trying to assess the potential impacts to their communities, and reviewing their current regulations and policies to determine if they are prepared to manage the impacts. One of the important issues being addressed is the potential degradation of the streets within these cities due to the installation of extensive fiber optic systems. Many cities and counties are considering adoption of a street deterioration fee

Four of the agencies leading the way to adopt such a fee are the City and County of San Francisco, the City of Sacramento, the City of San Diego, and the City of San Bernardino. The City and County of San Francisco joined with San Francisco State University to study the impacts of utility cuts on street pavement in the City of San Francisco. This study was completed in May of last year. Based on the results of this study, an ordinance is being developed to adopt a street deterioration fee. A draft of the ordinance is not yet available, however the basis of the ordinance is well documented in the study.

The City of Sacramento has developed a proposed ordinance to adopt a street deterioration fee. Staff has held a workshop with their city council and is currently reviewing the proposal with their local utility companies. The basis of the proposed fee includes the same street deterioration studies used by Anaheim. The calculation of the fees is based on the replacement value of the street, similar to Anaheim's proposal, however the fee is calculated on a square yard basis. Staff anticipates recommending the ordinance to council for adoption within the next several months.

The City of San Diego has drafted an ordinance to adopt a street deterioration fee modeled after the Phoenix study and Phoenix fee schedule. San Diego has already experienced major impacts due to the installation of telecommunication facilities by more than ten different companies. San Diego staff reports major impacts to infrastructure due to the telecommunication installations. The proposal to adopt a street deterioration fee was discussed at a recent meeting of the San Diego Rule Committee and the proposal will be agendized for further discussion and action in approximately 60 days.

The City of San Bernardino has drafted an ordinance to adopt a street deterioration fee and is in the process of holding informational meetings with their local utility companies to discuss the proposal. The ordinance will then be recommended to council for adoption.

A number of Orange County cities anticipate moving forward with adoption of the model ordinance developed by the Orange County City Engineer's Association Pavement Subcommittee. In an informal survey held at the January meeting of the Orange County City Engineer's Association thirteen cities planned to recommend adoption to their city councils within the next six months to one year. The model ordinance is the same ordinance being proposed by Anaheim staff, however, it is anticipated that each city will develop their own fee schedule based on the replacement value of the pavement in their cities.

DEPARTMENT OF
PUBLIC WORKS

ADMINISTRATION

CITY OF SACRAMENTO
CALIFORNIA

CITY HALL
ROOM 200
915 I STREET
SACRAMENTO, CA
95814-2608

PH 916-264-7110
FAX 916-264-5573

October 26, 1995

City Council
Sacramento, California

Honorable Members in Session:

SUBJECT: INFORMATIONAL REPORT CONCERNING MANAGEMENT AND REPAIR OF CUTS IN THE CITY'S TRANSPORTATION INFRASTRUCTURES

LOCATION: Citywide.

COUNCIL DISTRICT: All districts.

RECOMMENDATION:

This report is information only. With the Council's concurrence, staff will proceed to meet with the community and business sector to discuss the enclosed material. Staff will then return to Council to adopt the ordinance and establish the following:

- Street cut policies and resolutions by January 1996.
- A consistent Citywide Method of Pavement Repair, otherwise known as the New Pavement Repair Policy, a draft copy of which is attached.
- Authorization for the Public Works Director to modify and update the New Pavement Repair Policy.
- An excavation mitigation fee to offset the damage to streets caused by cutting them.
- An ordinance modifying City Code Sections 38.03.26, 27, & 32.

CONTACT PERSON: **Shawn O'Brien, Sr. Engineer, Street Division 433-6336.**

FOR COUNCIL MEETING OF: ~~October 31~~, 1995
Nov 7,

City Council
Report Concerning Management and Repair of Cuts in the City's Transportation Infrastructure
October 26, 1995

SUMMARY:

This report proposes that an excavation mitigation fee be established to help finance the added long term repair costs associated with cutting existing street surfaces, to access cables, pipes and other facilities housed below. Generally, the City proposes the following fees based upon the age and classification of the street:

	RESIDENTIAL	NON-RESIDENTIAL
Less than 5 yrs.	$ 3.78 / sq. yd.	$ 4.67 / sq. yd
More than 5 yrs.	$ 2.52 / sq. yd.	$ 2.66 / sq. yd.
Over 15 yrs.	$ 1.36 / sq. yd.	$ 0.86 / sq. yd.

No fee would be assessed in the two (2) years prior to a planned overlay or reconstruction project.

COMMITTEE/COMMISSION ACTION:

None.

BACKGROUND INFORMATION:

Everyday the streets of Sacramento are cut to allow access to the facilities under their surface. New cable, drainage and other systems are installed and worn systems replaced. No one argues that these systems are not needed, yet only a few cities have assessed the impact street cuts have on the life cycle costs of the street surface itself. Studies recently performed for the cities of Phoenix, Arizona and Burlington, Vermont have now quantified the decrease in service life. These studies suggest that cuts in a street reduce its life by a factor of 1.3.

San Francisco, San Diego and Anaheim are among many cities in the process of developing fees to help pay for the extra maintenance associated with cutting into the street surface. Most often the fee is rolled into the cost of an encroachment permit. This report proposes the establishment of a user fee. Those cutting into the street would reimburse the City for the decrease in the service life and the corresponding increase in the maintenance cost of the street surface.

This report uses a reduction of pavement life factor of 1.3 to establish the proposed user fee. The calculations, assumptions and rational for the proposed fees are explained further in Attachment 1. It is proposed that fees be assessed on the basis of areas repaved.

By enacting a Street Cut Policy containing a user fee, the City should reap benefits beyond the partial offset of the increased maintenance costs. In an effort to avoid or mitigate the fee, cooperation among the various entities working in the City's streets should increase and be encouraged. Such cooperation should reduce the number of individual cuts into a street and help relieve the inconvenience and delays due to construction currently borne by the public. The aesthetics of the area should also be enhanced.

Enacting the proposed Street Cut Policy is a proactive approach to dealing with the problem created when a street is cut. This policy encourages

- Cooperation among those working in the streets
- A reduction in the number of street cuts
- A reduction in the delays and inconvenience associated with street cuts
- Recapturing a portion of the added maintenance cost currently borne by the City and its rate payers
- Redirecting scarce resources for uses other than the repair of prematurely failed streets.

FINANCIAL CONSIDERATIONS:

The excavation mitigation fee would have a direct impact on all parties, including City departments, who work in the City's streets. The exact amount of these impacts is difficult to assess, as the fee is a function of street age and classification. By avoiding cuts into a street early in its life, an entity planning and coordinating work with the City could reduce the fee. To facilitate the previously outlined process, the City is currently updating its computerized Pavement Management System, so as to accurately project future street Capital Improvement Projects.

The cost of maintaining facilities under City streets would rise. The costs to outside agencies are difficult to assess; however, during fiscal year 93/94, the Street Division patched approximately 32,300 sq. yds. of street cut by the City's Utility Department alone. If all of those streets had been more than five (5) years old and less than fifteen (15) years old and in non-residential areas, the fees collected would have amounted to **$85,918.00** ($2.66 sy x 32,300 sy).

The following charts show the costs of the excavation mitigation fee that would be collected at the proposed rate, assuming a typical one block long installation.

TYPICAL FEE			
Street Age	**Type of installation**	**Fee**	
		Residential	**Non-Residential**
Less 5 years	1 block - 12" pipe	$ 1,175.99	$ 1,452.88
	1 block - rocksawed conduit	808.50	998.87
	4' x 8' repair	58.82	72.67
Over 5 yrs / less 15 yrs	1 block - 12" pipe	294.00	310.34
	1 block - rocksawed conduit	146.99	155.16
	4' x 8' repair	12.60	13.30
Over 15 yrs	1 block - 12" pipe	158.69	100.34
	1 block - rocksawed conduit	79.33	50.16
	4' x 8' repair	6.80	4.30
	2 years prior to planned overlay or reconstruction	0.00	0.00

ENVIRONMENTAL CONSIDERATIONS:

If enacted, this policy should have a positive impact on the environment. Cuts in the street would be reduced, cutting down on the dust, inconvenience and traffic congestion caused by construction activities on City streets.

POLICY CONSIDERATIONS:

By enacting the proposed Pavement Cut Policy, the City will be taking a proactive stance in an effort to better manage the City's infrastructure. The benefits derived from this policy are increased coordination of work in our streets, a reduction in the number of street cuts, as well as less noise, dust and congestion due to less construction in our streets. With less scarring of our streets, the aesthetics of our neighborhoods will also be preserved.

The costs of these improvements will be shifted from the City and its tax payers to the entities cutting into City streets through the assessment of a user fee otherwise known as an Excavation Mitigation Fee.

City Council
Report Concerning Management and Repair of Cuts in the City's Transportation Infrastructure
October 26, 1995

MBE/WBE:

Not applicable.

Respectfully submitted,

Barry Bates
Street Division Manager

FOR COUNCIL INFORMATION:

APPROVED:

William H. Edgar
City Manager

Robert L. Lee
Director of Public Works, Field Services

ATTACHMENT 1

DETERMINATION OF EXCAVATION MITIGATION

For the purpose of establishing the excavation mitigation fee, the City's streets were lumped into two (2) broad categories; Residential and Non-residential. This was done as the life of the pavement varies by its use. Maintenance schedules also vary by intended use. While more than two categories can be used to classify streets, for this report, the two classifications are sufficient.

In establishing this fee, the net present value (NPV) of the maintenance stream is accessed and annualized for four (4) conditions.

(a) The case where no cuts take place.
(b) The effects of a cut 2.5 years after reconstruction.
(c) The effects of a cut 10 years after reconstruction.
(d) The effects of a cut 16 years after reconstruction.

The difference in the NPV between case A and B establishes the extra costs associated with cutting a 2.5 year old surface; difference between the NPV case A to C establishes the extra costs associated with cutting the street 10 years after surfacing and the difference between the NPV case A to D establishes the extra costs associated with cutting the street 16 years after surfacing. It has been assumed that cutting the street reduces it's remaining life by a thirty (30%) percent as suggested by the Phoenix, Arizona study.

Cost assumption listed below were taken from the City's Pavement Management System report presented to Council in 1986. Street Division feels that these numbers are still representative of current costs.

	Cost/SY Residential	Non-Residential
Reconstruction	$15.00	$20.00
Slurry Seal	.45	.45
Cape Seal	1.75	1.75
2" Overlay	5.00	
1.5" Overlay	3.00	

The maintenance cycle for a residential street assumes that a slurry seal will be put down at years 5 and 9 and that cape seals will be placed at years 12 and 18 followed by a 1.5" overlay in year 25. At that point, the maintenance cycle would begin again.

The similar cycle for a non-residential street would have cape seals placed at years 5 and 12 followed by a 2" overlay at year 20.

Costs not considered in this report include the costs of vehicular delays and public inconvenience. All of these costs, while real, are not included in our costs. Only the costs of increased maintenance of the area actually resurfaced is considered. These factors tend to make the proposed fee conservative.

The next several pages list the major assumptions and formulas used to calculate the proposed fees. In accordance with these calculations it is recommended that the fees be set at the following levels:

For streets less that 5 years old

Residential Streets	$3.78 per sq. yd.
Non-Residential Streets	4.67 per sq. yd.

For streets over 5 years old and less that 15 years old

Residential Streets	$2.52 per sq. yd.
Non-Residential Streets	2.62 per sq. yd.

For streets over 15 years old

Residential Streets	$1.36 per sq. yd.
Non-Residential Streets	0.86 per sq. yd.

No fee would be charged in the 2 year prior to a planned overlay or reconstruction

The structure of this fee makes it clear that the City would prefer streets be cut near the end of their design life. It is hoped that this structure will encourage cooperations among all parties using our streets and lower everyone's operating costs.

FORMULA

Factor = [(1+g)^T] x [1/(1+r)^T]

Net Present Value = NPV = Cost X Factor

Equivalent Annual Costs = EAC = {Total NPV X (r-g)} / [1 - {(1+g) / (1+r)} ^T]

Fee = {(difference in EAC / r} X [1 - (1+r)^-T]

r = discount rate g = inflation rate T = period

ASSUMPTIONS

Inflation rate = historical rate = 4.5%

Discount rate = conservative short term rate = 6.5%

STREET TYPE: RESIDENTIAL

INFLATION RATE: 4.50%
DISCOUNT RATE: 6.50%

UNCUT

YEAR	TYPE OF MAINTENANCE	COST/SY	FACTOR	NPV PER SY
0	Reconstruct / New	$15.00	1	$15.00
5	Slurry Seal	$0.45	0.909564315	0.41
9	Slurry Seal	$0.45	0.843140875	0.38
12	Cape Seal	$1.75	0.796526432	1.39
18	Cape Seal	$1.75	0.710886535	1.24
25	1.5" Overlay	$3.00	0.622539721	1.87
	TOTAL Net Present Value (NPV)			20.29
EQUIVALENT ANNUAL COST				1.08

CUT AT YEAR 2.5

YEAR	TYPE OF MAINTENANCE	COST/SY	FACTOR	NPV PER SY
0	Reconstruct / New	$15.00	1	$15.00
2.5	CUT			
4	Slurry Seal	$0.45	0.926972245	0.42
7	Slurry Seal	$0.45	0.875723045	0.39
9	Cape Seal	$1.75	0.843140875	1.48
13	Cape Seal	$1.75	0.781568189	1.37
18	1.5" Overlay	$3.00	0.710886535	2.13
	TOTAL NPV			20.79
EQUIVALENT ANNUAL COST				1.44

CUT AT YEAR 10

YEAR	TYPE OF MAINTENANCE	COST/SY	FACTOR	NPV PER SY
0	Reconstruct / New	$15.00	1	$15.00
5	Slurry Seal	$0.45	0.909564315	0.41
9	Slurry Seal	$0.45	0.843140875	0.38
10	CUT			
11	Cape Seal	$1.75	0.811770957	1.42
15	Cape Seal	$1.75	0.752489146	1.32
20	1.5" Overlay	$3.00	0.684437275	2.05
	TOTAL NPV			20.58
EQUIVALENT ANNUAL COST				1.30

CUT AT YEAR 16

YEAR	TYPE OF MAINTENANCE	COST/SY	FACTOR	NPV PER SY
0	Reconstruct / New	$15.00	1	$15.00
5	Slurry Seal	$0.45	0.909564315	0.41
9	Slurry Seal	$0.45	0.843140875	0.38
12	Cape Seal	$1.75	0.796526432	1.39
16	CUT			
17	Cape Seal	$1.75	0.724492019	1.27
22	1.5" Overlay	$3.00	0.658972087	1.98
	TOTAL NPV			20.43
EQUIVALENT ANNUAL COST				1.20

FEE FOR CUT AT YEAR 2.5

Difference in EAC	$0.36
Fee for this difference	3.76

FEE FOR CUT AT YEAR 10

Difference in EAC	$0.22
Fee for this difference	2.42

FEE FOR CUT AT YEAR 16

Difference in EAC	$0.12
Fee for this difference	1.38

STREET TYPE: NON-RESIDENTIAL

INFLATION RATE:	4.50%
DISCOUNT RATE:	6.50%

UNCUT

YEAR	TYPE OF MAINTENANCE	COST/SY	FACTOR	NPV PER SY
0	Reconstruct / New	$20.00	1	$20.00
5	Cape Seal	$1.75	0.909564315	1.59
12	Cape Seal	$1.75	0.796526432	1.39
20	Cape 2" Overlay	$5.00	0.684437275	3.42
	TOTAL NPV			26.41
EQUIVALENT ANNUAL COST				1.67

CUT AT YEAR 2.5

YEAR	TYPE OF MAINTENANCE	COST/SY	FACTOR	NPV PER SY
0	Reconstruct / New	$20.00	1	$20.00
1	CUT			
4	Cape Seal	$1.75	0.926972245	1.62
9	Cape Seal	$1.75	0.843140875	1.48
15	2" Overlay	$5.00	0.752489146	3.76
	TOTAL NPV			26.86
EQUIVALENT ANNUAL COST				2.17

CUT AT YEAR 10

YEAR	TYPE OF MAINTENANCE	COST/SY	FACTOR	NPV PER SY
0	Reconstruct / New	$15.00	1	$20.00
5	Cape Seal	$1.75	0.909564315	1.59
10	CUT			
11	Cape Seal	$1.75	0.811770957	1.42
17	2" Overlay	$5.00	0.724492019	3.62
	TOTAL NPV			28.06
EQUIVALENT ANNUAL COST				2.04