

FEDERAL ASSISTANCE		2. APPLICANT'S APPLICATION	a. NUMBER n/a	3. STATE APPLICATION IDENTIFIER	a. NUMBER n/a
1. TYPE OF ACTION (Mark appropriate box)	<input type="checkbox"/> PREAPPLICATION <input checked="" type="checkbox"/> APPLICATION <input type="checkbox"/> NOTIFICATION OF INTENT (Opt) <input type="checkbox"/> REPORT OF FEDERAL ACTION	b. DATE Year month day 19	b. DATE Year month day ASSIGNED 19		
4. LEGAL APPLICANT/RECIPIENT				5. FEDERAL EMPLOYER IDENTIFICATION NO.	
a. Applicant Name : City of Portland, Oregon b. Organization Unit : Office of Planning and Development c. Street/P.O. Box : 1220 S.W. Fifth Ave d. City : Portland e. State : Oregon f. Contact Person (Name & telephone No.) : Maxine Borcharding (503) 249-1111 g. County : Multnomah h. ZIP Code : 97208				a. NUMBER : 660002 b. TITLE : Air Pollution Control Program Grants	
7. TITLE AND DESCRIPTION OF APPLICANT'S PROJECT				8. TYPE OF APPLICANT/RECIPIENT	
A Proposal to Evaluate Effectiveness of Vacuum Sweeping to Control Paved Road Dust				A-State B-Interstate C-Substate D-District E-City F-School District G-Special Purpose District H-Community Action Agency I-Higher Educational Institution J-Indian Tribe K-Other (Specify):	
10. AREA OF PROJECT IMPACT (Names of cities, counties, States, etc.)				12. TYPE OF APPLICATION	
				A-New B-Renewal C-Revision D-Continuation E-Augmentation Enter appropriate letter <input type="checkbox"/>	
13. PROPOSED FUNDING		14. CONGRESSIONAL DISTRICTS OF:		15. TYPE OF CHANGE (For 12c or 12e)	
a. FEDERAL	\$ 200,000 .00	a. APPLICANT	b. PROJECT	A-Increase Dollars B-Decrease Dollars C-Increase Duration D-Decrease Duration E-Cancellation F-Other (Specify): n/a	
b. APPLICANT	50,042 .00	16. PROJECT START DATE	17. PROJECT DURATION	Enter appropriate letter(s) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
c. STATE	5,300 .00	Year month day	2 Months		
d. LOCAL	.00	5 19 80			
e. OTHER	.00	18. ESTIMATED DATE TO BE SUBMITTED TO FEDERAL AGENCY	19 10 15		
f. TOTAL	\$ 267,942 .00				
10. FEDERAL AGENCY TO RECEIVE REQUEST (Name, City, State, ZIP code)				21. REMARKS ADDED	
USEPA Region 10 Air Programs Branch, Seattle, Wa. 98101				<input type="checkbox"/> Yes <input type="checkbox"/> No No response attached	
22. THE APPLICANT CERTIFIES THAT		a. To the best of my knowledge and belief, data in this preapplication/application are true and correct, the document has been duly authorized by the governing body of the applicant and the applicant will comply with the attached assurances if the assistance is approved. (1) (2) (3)		b. If required by OMB Circular A-95 this application was submitted, pursuant to instructions therein, to appropriate clearinghouses and all responses are attached: epousu	
23. CERTIFYING REPRESENTATIVE		a. TYPED NAME AND TITLE		b. SIGNATURE	
		Connie McCready Mayor of the City of Portland			
		c. DATE SIGNED		Year month day 19	
24. AGENCY NAME				25. APPLICATION RECEIVED	
				Year month day 19	
26. ORGANIZATIONAL UNIT				27. ADMINISTRATIVE OFFICE	
28. ADDRESS				29. FEDERAL APPLICATION IDENTIFICATION	
31. ACTION TAKEN		32. FUNDING		34. STARTING DATE	
<input type="checkbox"/> a. AWARDED <input type="checkbox"/> b. REJECTED <input type="checkbox"/> c. RETURNED FOR AMENDMENT <input type="checkbox"/> d. DEFERRED <input type="checkbox"/> e. WITHDRAWN		a. FEDERAL \$.00 b. APPLICANT .00 c. STATE .00 d. LOCAL .00 e. OTHER .00 f. TOTAL \$.00		Year month day 19 35. CONTACT FOR ADDITIONAL INFORMATION (Name and telephone number)	
				36. ENDING DATE 19	
				37. REMARKS ADDED	
				<input type="checkbox"/> Yes <input type="checkbox"/> No	
33. FEDERAL AGENCY A-95 ACTION				38. FEDERAL AGENCY A-95 OFFICE	
a. In taking above action, any comments received from clearinghouses were considered. If agency response is due under provisions of Part 1, OMB Circular A-95, it has been or is being made.				(Name and telephone no.)	

SECTION I - APPLICANT/RECIPIENT DATA

SECTION II - CERTIFICATION

SECTION III - FEDERAL AGENCY ACTION

1.0 Background on the Research on Road Dust Particulate Control

Air quality studies throughout the nation have shown that soil and road dust contribute about 40 to 50 percent of the particulate concentrations in many urban areas. Even if a revised inhaleable particulate standard is adopted by the Environmental Protection Agency, studies in Oregon show that soil and road dust appears likely to remain the single largest contributing source, probably accounting for 25 to 30 percent of the particulate mass less than 15 microns in size. Results from the Portland Aerosol Characterization Study indicate that within metropolitan Portland paved road dust is the most likely source of the locally generated geologic component.

Because of the importance of these source contributions to the particulate problem, a number of soil dust control studies have been conducted in various states. Studies of the effectiveness of road dust control measures have produced contradictory results. For example, of 15 studies to assess the effectiveness of street cleaning at reducing particulate concentrations, six studies showed that reductions were achieved and nine showed no effectiveness or negative effectiveness. A primary reason for the conflicting results appears to be that researchers have not been able to adequately factor out other variables such as changes in meteorology or local fugitive influences. Given the magnitude of soil dust impacts on particulate concentrations (whether the current standard or a 15 micron standard is assumed) it is appropriate for EPA to support several well-designed paved road dust control studies to determine whether control measures can improve ambient particulate air quality. The City of Portland Public Works Department and the Oregon Department of Environmental Quality are proposing that EPA sponsor a study to assess the effectiveness of vacuum sweeping heavily loaded paved roads in industrial areas.

2.0 Objectives of the Study

Primary Objective

Determine the effectiveness of daily vacuum sweeping heavily loaded streets in reducing ambient particulate concentrations in two industrial areas. Determine effectiveness with regards to the total suspended particulate fraction and the inhaleable particulate fraction. Provide this effectiveness information in a format and manner applicable to other cities.

Secondary Objective

Develop a paved road dust data base upon which emission factor studies and research on the effect of important variables can be based.

3.0 Special Qualifications of Portland as a Study Location

Portland is especially qualified as a location for such a study because of its extensive information on chemically-based identification of particulate sources. The PACS study (Portland Aerosol Characterization study) conducted in 1977 and 1978, was the most sophisticated particulate characterization study conducted to date in the nation. Organic and inorganic elements were identified in both fine and coarse particulate

fractions, and chemical mass balance techniques were used to identify the relative contributions of various sources to the fine and total particulate concentrations. The Department's experience with these techniques makes it especially well qualified to participate in a paved road dust control study, because these techniques allow differences in "soil-like" dust concentrations to be monitored rather than merely differences in total hi-volume sampler weights. Soil and road dust concentrations can be determined by evaluating the relative amounts of silicon, iron, calcium, and aluminum collected on filters.

During the PACS study, a considerable effort was spent in upgrading the classification scheme for Portland meteorology. The DEQ has experience in classifying meteorological types of days. This capability will be of significant benefit in conducting the study because it allows meteorological variables to be controlled during the data evaluation phase to indicate the benefits of the street sweeping program.

The City of Portland Public Works Department is interested in supporting such a street sweeping study, as evidenced by the letter included as Attachment A. Such local support is important; some previously planned studies, such as the Chattanooga Study, were never implemented because of a lack of such support. Attachment B is a letter from Mayor McCreedy supporting the project.

4.0 General Study Design

The study design discussed below is intended to provide an initial overview of the project scope. Detailed design development will occur during the first phase of the program.

It is proposed that a demonstration control project based on vacuum sweeping of streets be conducted in Portland during the 6 driest months of the year from April through September of 1980. EPA would provide three of the most advanced vacuum sweepers available for use in the study. Selection of the machine would be coordinated with the Public Works Department, DEQ, and EPA. Sweeping effectiveness would be evaluated at in two relatively heavy industrial areas in Portland.* Sweeping would be conducted in the 1/2 square mile area around each of these two sites for a two week period and then a two week period with no sweeping would occur. Such a pattern would allow sweeping and nonsweeping periods to be compared while minimizing the differences in meteorology that might occur if one 3 month period were compared with another. This data collection scheme would also allow comparison to chemical data collected during the PACS study in 1977 and 1978.

Three to four special air quality monitoring sites would be operated during the study. Two of these locations will be monitoring sites for which detailed particulate chemical data was collected during the PACS year. (The Industrial Air Products PACS site is located in the first industrial test area, see Figure 1). A second site will be located in the second

*One industrial are has been chosen and is identified in Figure 1. A second test area will be chosen prior to November 1, 1980 (see work schedule).

industrial test area. A control site will be located at 18th and Couch, a mile east of the Willamette River. If evaluation of TSP levels in the test areas as compared to TSP levels at 18th and Couch indicate a widely variable ratio, background monitoring immediately upwind of the test areas will be included in the design. The location of the IAP and control sites are shown in Figure 2.

Effectiveness of street sweeping would be evaluated based on comparison of soil dust concentrations 1) for the two PACS sites during the sweeping periods versus during the PACS year 2) for the monitors within the sweeping areas during the sweeping period versus the non-sweeping period, and 3) for the monitors within the sweeping areas during sweeping periods versus the control site one mile away. The analysis will attempt, as best as possible, to control other influencing variables, such as meteorology, traffic, and street sweeping, to provide an accurate estimate of control effectiveness.

Monitoring would be conducted daily at all sites. It is proposed that three monitors be operated at each site; a hi-volume sampler for total weights, a low-volume sampler to collect chemical data to allow determination of total soil, lead, and road dust concentrations, and a 15-micron size cut impactor to allow soil dust chemical identification of the inhaleable particulate fraction. Wind speed and direction measurements would be conducted hourly in the test area. Traffic levels will be monitored at five locations.

The Study will be conducted in three phases. In phase 1, the contractor would design the study format, with emphasis on controlling enough variables that accurate effectiveness data can be generated. Coordinating arrangements would be conducted during this phase and the vacuum sweeper to be used would be selected. Phase 2 would consist of the first two months of data collection and sweeping followed by one month of evaluation of the data to review whether reasonable results were being generated. If necessary the program design would be modified at this stage. Phase 3 would consist of the final three months of sweeping and monitoring and evaluation of the effectiveness of the vacuum sweeping.

5.0 Responsibility for Project Elements

Oregon DEQ

- Assist contractor in designing study
- Conduct quality assurance work on monitoring equipment
- Classify all study days into meteorological regimes
- Collect daily surface meteorological data at downtown site
- Provide technical review of program results.

City of Portland

- Assist contractor in designing study
- Provide sweeper operators during study period
- Collect daily traffic information at five locations
- Provide coordination of all city work elements
- Provide technical review of program results.

EPA

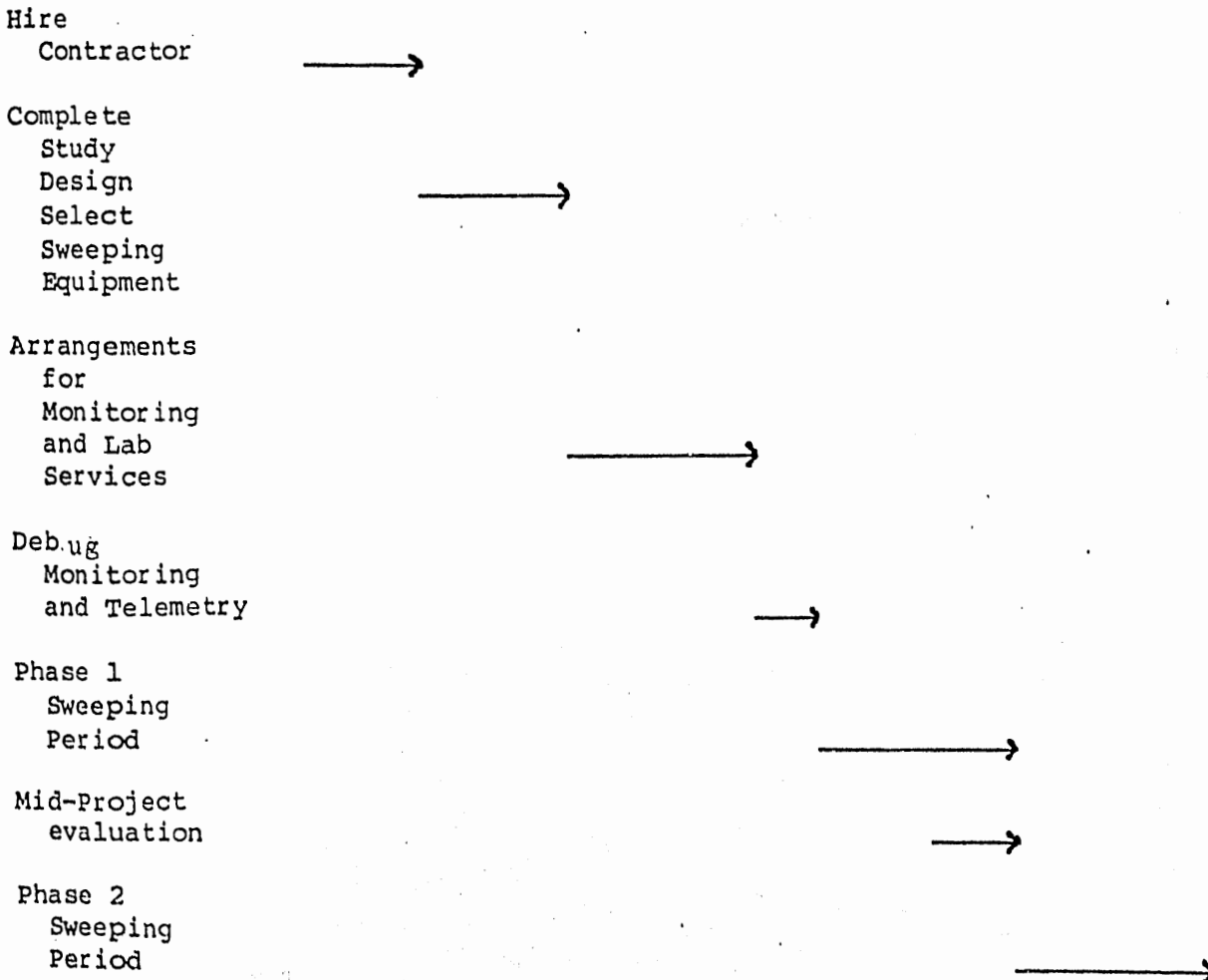
- Provide technical assistance in designing study
- Provide primary funding for the project
- Provide state-of-the art vacuum sweepers for use in study
- Provide technical review of program results.

Contractor

- Design study based on concepts in this proposal, with emphasis on controlling sufficient variables to assess actual effectiveness
- Coordinate and conduct air quality monitoring, lab analysis, air quality data processing, and quality assurance programs
- Manage overall project
- Evaluate study results through statistical means to produce effectiveness information applicable to other cities
- All program documentation and reporting tasks

6.0 Schedule

Project Schedule (months from award)
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20



Project Schedule (months from award) cont.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Data Analysis →

Preparation
Draft Report →Preparation
of Final
Report and
Presentation →Project BudgetBUDGET SUMMARYMonitoringWork Conducted By

Laboratory Analysis	\$38,000	Contractor
Air Monitoring Services and Supplies	3,500	Contractor
Air Quality Technicians	25,500	Contractor
Monitoring Equipment	10,500	Contractor
Vehicle Rental	1,600	Contractor
Site Power and Rental	1,900	

Sweeping

3 Vacuum Sweepers	45,000	N.A.
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Management and Evaluation

Design Study Based on Proposed Concepts	10,000	Contractor
Project Manager (salary, overhead, travel)	22,000	Contractor
City Program Coordinator	5,000	
Statistical Analysis and Data Processing	7,000	Contractor
Publication Costs	2,000	Contractor
Mid-project Study Evaluation	8,000	Contractor
Effectiveness Evaluation and Final Report Preparation	20,000	Contractor

Value of Services Contributed By Local Agencies or GovernmentsCity of Portland

Public Works Operations Supervisor	\$ 2,336
Foreman Street Cleaning Section	4,006
Street Cleaning Equipment Operators	42,432
Day Crew Operators	884
Fleet Maintenance Services	<u>9,984</u>

TOTAL	\$59,642
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Oregon Department of Environmental Quality

Study Design and Project Review	\$5,300
Meteorological Analysis	1,000
Data Processing	500
Monitoring Quality Assurance Assistance	<u>1,500</u>

TOTAL	\$8,300
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Total of Estimated Project	\$267,942
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Proposed EPA Funding Support	200,000
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City of Portland in Kind Services	59,642
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Oregon DEQ in Kind Services	8,300
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Budget Details

I. <u>Monitoring</u>	\$ 81,000
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A. <u>Laboratory Analysis</u>	\$ 38,000
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3 sites	
180 days/site	
2 sets chemical data/site	
<u>\$35/set chemical data</u>	
\$37,800	- \$38,000

B. <u>Air Monitoring S & S (filters, etc.)</u>	\$ 3,500
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C. <u>Air Quality Technician (2)</u>	\$ 25,500
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\$14,000/yr * .7 FTE	=	19,600
Fringe & OPE (30%)		<u>5,900</u>
		25,500

D.	<u>Monitoring Equipment</u>	\$10,500
	\$700 for 2nd hi-volume sampler x3 sites	\$ 2,100
	\$300 for low-volume sampler x2x3 sites	\$ 1,800
	\$600 for inhaleable particulate sampler x 2x3 sites	\$ 3,600
	\$1000 for rain gauge	\$ 1,000
		<u>8,775</u>
	+ 15% for replacement	<u>1,320</u>
		\$10,095
E.	Site power and rental	\$ 1,900
	\$500/site x 2 =	\$ 1,000
	Electricity \$50/month x 3x6 =	900
		<u>\$ 1,900</u>
F.	Vehicle Rental	\$ 1,600
	\$200/month x 8 months =	\$ 1,600
II.	<u>Sweeping</u>	\$45,000
	- 3 State of Art Vacuum Sweepers to be provided by EPA @	\$45,000 \$15,000
III.	<u>Project Management and Evaluation</u>	\$74,000
	- Design Study Based on Proposed Concepts	\$10,000
	- Project Manager (salary, overhead, travel)	22,000
	- City Program Coordinator	5,000
	- Subcontract for Statistical Analysis	7,000
	- Publication Costs	2,000
	- Mid-project Study Evaluation	8,000
	- Effectiveness Evaluation and Final Report Preparation	20,000
IV.	<u>Services Contributed By Local Agencies or Governments</u>	\$67,942
	<u>City of Portland</u>	
	- Public Works Operations Supervisor (100 man-hours)	\$ 2,336
	- Foreman Street Cleaning Section (200 man-hours)	4,006
	- Street Cleaning Equipment Operators (AEO-3 night crew; 312 operator days)	42,432
	- Day Crew Operators	884
	(transport of equipment to maintenance facility; average	

one trip per week per machine)

- Fleet Maintenance Services (maintenance, etc; two hours per machine day *312 machine days * \$16 per hour)	9,984
Total City of Portland	<u>\$59,642</u>
<u>Oregon Department of Environmental Quality</u>	
- Study Design Review and Project Review (400 man-hours)	\$5,300
- Meteorological Analysis (80 man-hours)	1,000
- Data Processing	500
- Monitoring Quality Assurance Assistance (120 man-hours)	<u>1,500</u>
Total DEQ	\$ 8,300
Total Value of Services Contributed By Local Governments or Agencies	\$67,942

ORDINANCE NO. 149364

An Ordinance authorizing an application to the United States Environmental Protection Agency for an air quality demonstration grant estimated at \$200,000 to evaluate the effectiveness of vacuum sweeping streets to control airborne particulates; authorizing contracts, and declaring an emergency.

The City of Portland ordains:

Section 1. The Council finds:

1. The United States Environmental Protection Agency is making available a demonstration grant to aid in evaluating specific air pollution control programs to reduce urban dust.
2. Under this grant, the Office of Public Works, the Oregon Department of Environmental Quality, and the Office of Planning and Development would conduct an experimental street vacuuming program to evaluate the effectiveness of this measure in reducing airborne dust. The grant, if awarded, would enhance the City's efforts to define and implement measures which will bring Portland into compliance with National Ambient Air Quality Standards.
3. The total project cost is estimated at \$267,000. Local match of \$67,000 is required and will be provided as in-kind services by Bureau of Economic Development, Bureau of Maintenance, Bureau of Traffic Engineering, and Department of Environmental Quality.
4. To qualify for this grant, a completed application must be filed with and received by the United States Environmental Protection Agency on or before April 10, 1980.
5. Should the City secure and accept this grant, it will be obligated to comply with the regulations of the United States Environmental Protection Agency.

NOW THEREFORE, The Council directs:

- a. The Mayor shall make application to the United States Environmental Protection Agency for a grant estimated at \$200,000 in aid of air pollution control strategy evaluation as per Exhibit "A" attached to the original only thereof, and by this reference made a part hereof.
- b. Should the described grant be approved, contracts or grant agreements are authorized.
- c. The Mayor is authorized to provide such information and assurances as are required for receipt, expenditure, and accounting for the grant project.

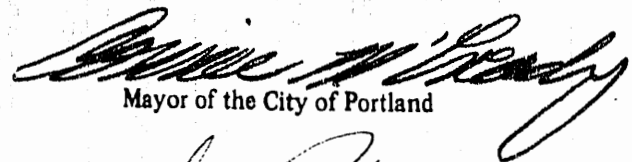
ORDINANCE No.

- d. The Mayor is authorized to provide assurances regarding the use of the grant as may be required by the United States Environmental Protection Agency.
- e. Expenditures under this grant are not authorized until the United States Environmental Protection Agency has approved the grant; the Council has specifically appropriated the funds; and the system of accountability has been established by the Bureau of Financial Affairs.
- f. Should the grant be approved and the Council accepts, overall project coordination will be provided by the Office of Planning and Development.

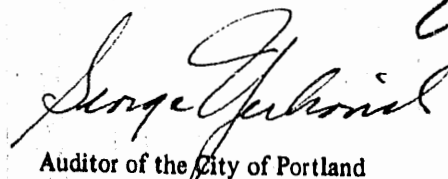
Section 2. The Council declares that an emergency exists because the regulations governing the grant application require immediate application, and delay in application may result in the loss of the opportunity to receive the grant; therefore, this ordinance shall be in force and effect from and after its passage by the Council.

Passed by the Council, APR 9 1980

Mayor Connie McCready
M. S. Borcharding:al
March 18, 1980


Mayor of the City of Portland

Attest:


Auditor of the City of Portland

Calendar No. ¹¹⁵³~~1113~~

ORDINANCE No. 149364

Title

An Ordinance authorizing an application to the United States Environmental Protection Agency for an air quality demonstration grant estimated at \$200,000 to evaluate the effectiveness of vacuum sweeping streets to control airborne particulates; authorizing contracts, and declaring an emergency.

APR 3 1980

CONTINUED TO APR 9 1980

THE COMMISSIONERS VOTED AS FOLLOWS:		
	Yeas	Nays
Ivancie	/	
Jordan	—	
<i>Lindberg</i>	/	
Schwab	/	
<i>McCready</i>	/	

4

FOUR-FIFTHS CALENDAR	
Ivancie	
Jordan	
McCready	
Schwab	
Goldschmidt	

INTRODUCED BY
Mayor Connie McCready

NOTED BY THE COMMISSIONER
Affairs
Finance and Administration <i>CMC</i>
Safety
Utilities
Works

BUREAU APPROVAL	
Bureau:	
Prepared By: M.S. Borcharding	Date: 3/18/80
Budget Impact Review:	
<input type="checkbox"/> Completed <input type="checkbox"/> Not required	
Bureau Head: <i>Sandra L. Robert</i>	

NOTED BY
City Attorney
City Auditor
City Engineer John M. Lang

Filed MAR 28 1980

GEORGE YERKOVICH
Auditor of the CITY OF PORTLAND

By *Gordon Powell*
Deputy

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